
FINAL
BIG OX ENERGY SIOUXLAND, LLC

DIGESTER SOLID WASTE CHARACTERIZATION
DAKOTA CITY, DAKOTA COUNTY, NE

Version No. 01

Prepared for:

THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

Task Assignment	:	TA-19-01A
Program ID Number	:	IWM-COMPLAINT
IIS Number	:	105921
Project Funding Code	:	04-105-84001587
Date Prepared	:	January 23, 2019
Contract	:	EES-2015-01
Prepared By	:	EA Engineering, Science & Technology, Inc., PBC (EA)
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January 2019

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1. INTRODUCTION

EA Engineering, Science & Technology, Inc., PBC (EA) was contracted by the Nebraska Department of Environmental Quality (NDEQ) to conduct sampling of stockpiled digester solids at Big Ox Energy Siouxland, LLC in Dakota City, Nebraska (subject site) (Figure 1). EA's work was performed under Environmental Services Contract No. EES-2015-01, Task Assignment TA-19-01A. Mr. Dan Bigbee is the EA project manager and Mr. Wade Gregson is the NDEQ project manager. The scope of work was outlined in the Work Plan included in Appendix A.

2. BACKGROUND INFORMATION

Big Ox Energy Siouxland, LLC accepts food industry and meat processing byproducts and through a digestion produces pipeline-grade natural gas (methane). Products produced during the process include biosolids for animal bedding and soil amendments, bioliquids for fertilizer and biogas while removing organic waste from landfill disposal. NDEQ completed a scheduled site inspection on January 2, 2019 which identified the accumulation of digester solids at the subject site (NDEQ 2019). During inspection it was noted that Big Ox was actively accumulating digester solids on the ground at the subject site. Digester solids are to be disposed of a landfill, but issues with the landfill and Big Ox halted landfill disposal of the solids. The onsite stockpiling of digester solids at the subject site is not in compliance with Bix Ox's Storm Water Pollution Prevention Plan (SWPPP) and solids may potential discharge to surface waters. stockpiled digester solids at the subject site was sampled to determine if any hazards are present in the solids.

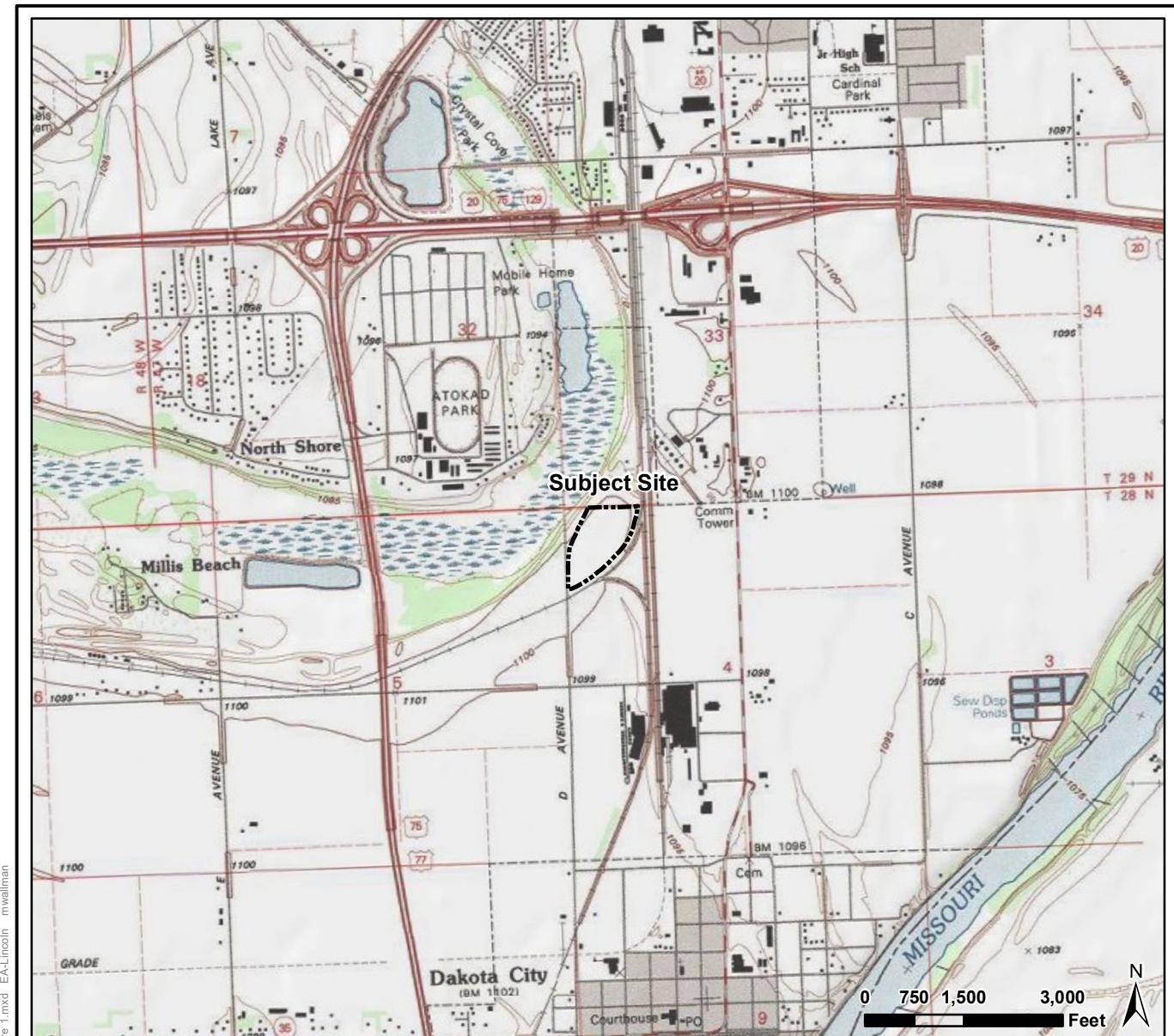
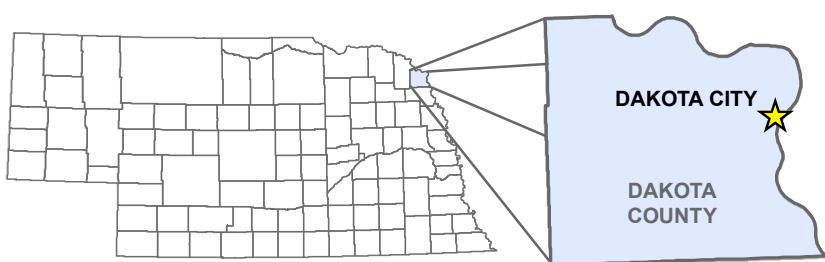


IMAGE SOURCE: ESRI, 2019

LEGEND

[Dashed Line] Big OX Boundary



EA Engineering, Science, and Technology, Inc., PBC			BIG OX ENERGY SIOUXLAND, LLC DIGESTER SOLID WASTE CHARACTERIZATION DAKOTA CITY, DAKOTA COUNTY, NEBRASKA				SITE LOCATION MAP	
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE	
DLB	—	MAW	DLB	AS SHOWN	JAN 2019	1531630	1	

3. FIELD EFFORT

EA collected four (4) composite and two (2) grab samples from the stockpile of digester solids on January 11, 2019. Personnel on site during sampling activities included Franklin Doerneman with EA, Jason Windhorst and Nathan Kush with NDEQ, and Desiree McClasen and Jody Anderson with Big Ox Energy. Observations on the stockpile included the following:

- Big Ox was actively adding digester solids to the stockpile and maintaining the pile using a telehandler equipped with a bucket.
- The perimeter of the stockpile was surveyed using a submeter GPS.
- The stockpile was photographed.
- Variations in the consistency/color of the digester solids was evident in the stockpile with variation unique to each addition of solids from the digester.
- For sampling purposes, it was found that the stockpile could not be walked on and all sampling activities would have to be completed from the edge of the stockpile.

Four composite samples were collected from the stockpile with each collected from a specific area of the stockpile. The telehandler was used to collect a quantity of solids interior to the stockpile perimeter at five locations and a non-frozen portion of the solids was placed in a clean zipper bag. After collection of five subsamples the solids were mixed and three 4-ounce glass jars were filled, labeled and placed on ice. Two grab samples were collected areas for the stockpile that were unique in composition. Three 4-ounce glass jars were filled for each grab sample, labeled and placed on ice.

Samples were transported to EA's Lincoln office and secured in a sample refrigerator for the night. Samples were shipped to Pace Analytical, Lenexa, Kansas for analytical analyses. Samples were analyzed for Volatile Organic Compounds (VOC) by EPA 8260C, semi-Volatile Organic Compounds by EPA 8270D, and RCRA metals by EPA 6010B/7471A.

A photographic log of field activities is provided in Appendix B. Sample collection field sheets are included as Appendix C.

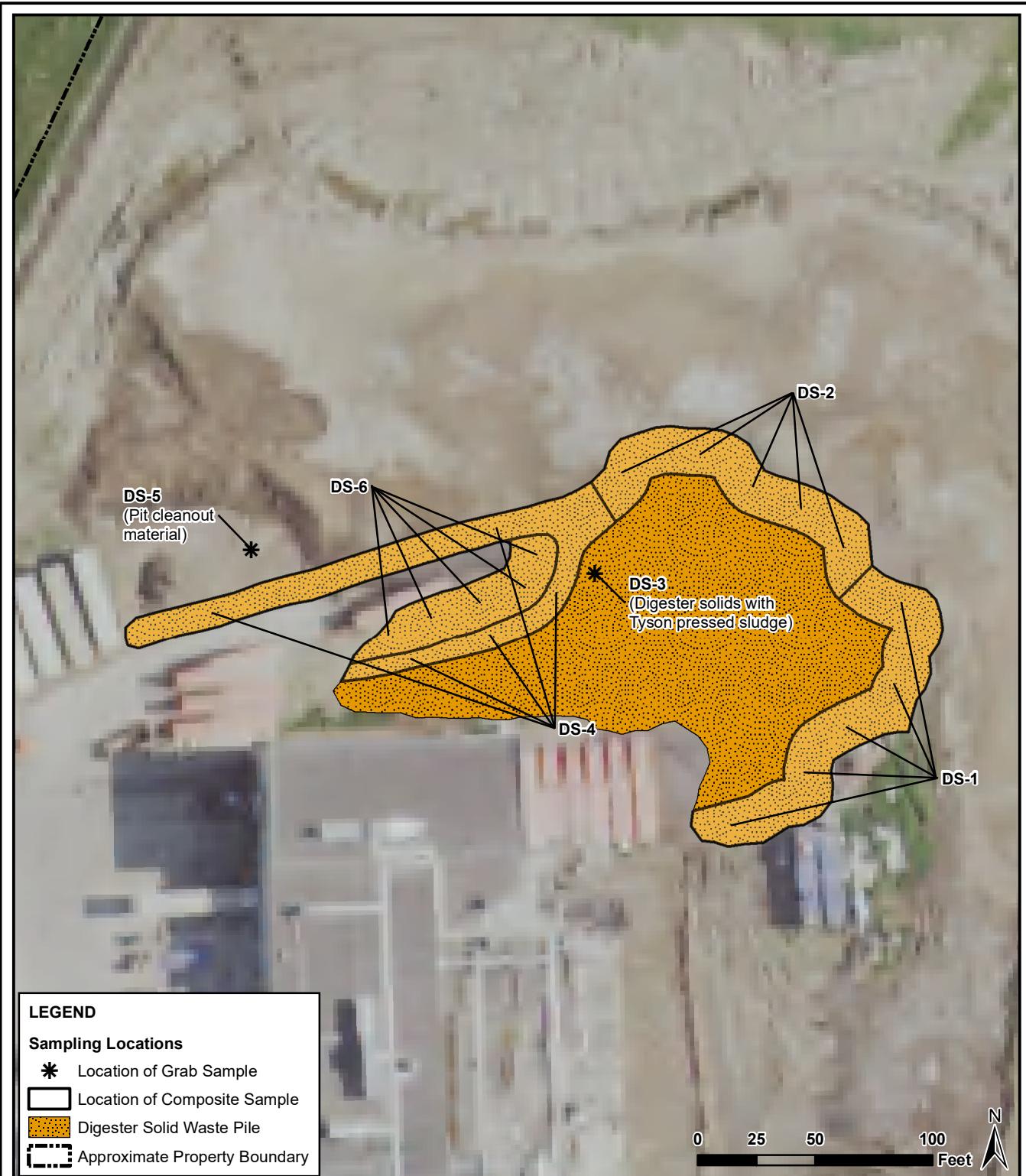


IMAGE SOURCE: ESRI, 2019

EA® EA Engineering, Science, and Technology, Inc., PBC			BIG OX ENERGY SIOUXLAND, LLC DIGESTER SOLID WASTE CHARACTERIZATION DAKOTA CITY, DAKOTA COUNTY, NEBRASKA			SAMPLING LOCATION MAP	
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
	—	MAW	DLB	AS SHOWN	JAN 2018	1531630	2

4. RESULTS

Table 1 lists results from the samples collected. One sample was above VCP limits for residential soil for the VOC 1,2-Dibromo-3-chloropropane. Complete analytical results are provided in Appendix D.

4.1. Deviations from Work Plan

The sampling scheme was adjusted in the field based on a change in site conditions. The footprint of the stockpiled digester solids was larger than anticipated and required modifying where the samples were collected from. EA also collected four (4) composite samples and two (2) grab samples.

5. REFERENCES

Nebraska Department of Environmental Quality (NDEQ). 2019. Memorandum, Big Ox Energy Siouxland LLC, South Sioux City NE, Site Visit. January 2, 2019.

Table 1. Stockpiled Digester Soils Summary of Analytical Results

Sample ID	DS-1	DS-2	DS-3	DS-4	DS-5	DS-6	Soil	
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Residential (mg/kg)	Industrial (mg/kg)
Metals - Method EPA 6010								
Arsenic	ND	2.3J	2.4J	ND	ND	2.2J	0.046	220
Barium	63.4	78.7	65.2	66.1	36.2	76.1	3,900	100,000
Cadmium	ND	ND	ND	0.39J	ND	ND	180	950
Chromium	137	94.1	138	144	69.1	111	-	-
Lead	3.1	3.6	2.4	3.1	2.8	2.4	400	800
Selenium	2.3J	1.9J	2.4J	ND	ND	2.0J	980	5,800
SVOC - Method EPA 8270								
4-Chloro-3-methylphenol	ND	26.5	ND	ND	ND	ND	-	-
3&4-Methylphenol (m&p Cresol)	40.6 M1	47.5	109	20.5	35.5	84	-	-
Phenol	21.0 M1	22.1	25.6	16.4	12.7	33.3	4,700	100,000
VOC - Method EPA 8260								
Acetone	7.13	2.86	5.26	6.07	1.68	3.21	15,000	100,000
2-Butanone (MEK)	0.129	0.571	1.29	0.251	1.56	0.138	6,800	100,000
n-Butylbenzene	0.0070J	0.0048J	0.0095J	0.0084J	0.0040J	ND	-	-
sec-Butylbenzene	0.0051J	ND	0.0049J	ND	ND	ND	-	-
Carbon disulfide	0.0257	0.0147J	0.0329	0.0215J	0.0152J	0.0206J	190	3,500
Ethylbenzene	0.0179J	ND	ND	ND	ND	ND	5.8	250
1,2-Dibromo-3-chloropropane	ND	ND	ND	0.0247J	ND	ND	0.0053	0.64
2-Hexanone	ND	ND	ND	0.0160J	0.0705	ND	-	-
Isopropylbenzene (Cumene)	ND	0.0087J	0.0765	0.0385	0.0253	0.0339	490	9,900
p-Isopropyltoluene	0.469	0.126	0.986	0.513	0.274	0.352	-	-
Methylene chloride	0.016J	ND	ND	ND	ND	ND	570	3,200

Sample ID	DS-1 (mg/kg)	DS-2 (mg/kg)	DS-3 (mg/kg)	DS-4 (mg/kg)	DS-5 (mg/kg)	DS-6 (mg/kg)	Soil	
							Residential (mg/kg)	Industrial (mg/kg)
VOC - Method EPA 8260								
Naphthalene	0.0201J	ND	0.0244J	0.0370J	0.0131J	0.0130J	3.8	170
1,1,2,2-Tetrachloroethane	ND	ND	ND	0.0051J	ND	ND	0.6	270
Toluene	0.325	0.681	10.8	2.55	0.88	ND	1,200	47,000
1,2,3-Trichlorobenzene	0.102	0.0239	0.132	0.104	0.0488	0.0455	-	-
1,2,4-Trichlorobenzene	0.0079J	ND	0.0082J	ND	0.0043J	0.0051J	14	260
1,2,4-Trimethylbenzene	0.0151J	0.0044J	0.0190J	0.0173J	0.0107J	0.0084J	76	1,800
1,3,5-Trimethylbenzene	ND	ND	0.0049J	0.0051J	ND	ND	68	1,500

Bold = detected value exceeds laboratory Reporting Limit (RL)

Bold and shaded = detected value exceeds RL and is above the specified remediation goal ¹ NDEQ 2018

J = estimated concentration above Method Detection Limit (MDL) and below the laboratory Report Limit (RL)

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2317704)
- Lead
- MSD (Lab ID: 2317705)
- Lead

APPENDIX A

Work Plan, Cost Estimate, and Task Assignments



EA Engineering, Science,
and Technology, Inc., PBC

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January 8, 2019

Mr. Wade Gregson
Remediation Section
Waste Management Division
Nebraska Department of Environmental Quality
1200 N Street, Suite 400, The Atrium
Lincoln, Nebraska

Subject: Contract EES-2015-01
Task Assignment TA-19-01A
Big Ox Energy Siouxland, LLC, Digester Solid Waste Characterization
Dakota City, Dakota County, Nebraska
IIS Number: 105921, Program ID No: IWM - Complaint
Cost Estimate and Work Plan – Version No. 02

Dear Wade:

The purpose of this letter is to forward EA Engineering, Science, and Technology, Inc., PBC's (EA) proposal for the above referenced site. In summary, EA proposes to perform the requested services as outlined in the attached documents on a time and materials basis for a cost currently estimated at \$5,446.

Please review the attachments to ensure that they meet your approval. EA's previously signed Consulting Services Contract EES-2015-01 will govern the contractual relationship on this project.

EA greatly appreciates the opportunity to serve you on this project. If I can be of any further assistance, please contact me at (402) 476-3766.

Sincerely,

Dan Bigbee
Project Manager

Enclosures

Big Ox Energy Siouxland, LLC
Digester Solid Waste Characterization Sampling Event
Dakota City, Dakota County, Nebraska

Work Plan, Cost Estimate, and QAPP Addendum

VERSION NO. 02

Prepared for:

THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

Task Assignment	:	TA-19-01A
Program ID Number	:	IWM – Complaint
IIS Number	:	105921
Project Funding Code	:	04-105-84001587
Date Prepared	:	January 8, 2019
Contract	:	EES-2015-01
Prepared By	:	EA Engineering, Science & Technology, Inc., PBC (EA)
EA Project Manager	:	Dan Bigbee
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Electronic Mail	:	<u>dbigbee@eaest.com</u>
NDEQ Project Manager	:	Wade Gregson
Telephone	:	(402) 471-3377

January 2019

Big Ox Energy Siouxland, LLC, Dakota City, NE

This Scope of Work is incorporated into the Consulting Services Contract referenced above between EA Engineering, Science, and Technology, Inc., PBC (EA) and the Nebraska Department of Environmental Quality (NDEQ). This scope includes EA's services to collect samples from digester solids stockpiled at Big Ox Energy Siouxland, LLC, 1616 D Avenue Dakota City, NE, 68731 (subject site).

EA will complete one mobilization to collect samples from the stockpiled digester solids using one staff person. An NDEQ field inspector will accompany the EA sampler and will be present during sampling at the subject site.

EA proposes the following:

- Collect three (3) composite samples and up to three (3) grab samples.
- The stockpiled digester solids is narrow and linear based on site photographs. Splitting the stockpiled digester solids into thirds will allow for a composite characterization of the stockpiled digester solids.
- Three (3) composite samples will be collected from the east 1/3, middle 1/3, and west 1/3 of the stockpiled digester solids. The stockpiled digester solids have not been dewatered and samples will have to be collected from the perimeter of the stockpile.
- Each composite sample will be comprised of five (5) sample aliquots collected from the representative part of the stockpiled digester solids. Two of the aliquots will be collected from the lower portion of the stockpile (one on the north side and one on the south side), two of the aliquots will be collected from the upper portion of the stockpile (one on the north side and one on the south side), and one will be taken from the middle of the stock pile alternating sides between the east 1/3, middle 1/3, and west 1/3.
- Digester solids will be collected at a depth of 1-foot into the face of the material at each sampling location. The stockpile may be frozen at time of sampling requiring the use of a pick ax or a shovel to remove frozen material. Digester solids (not frozen) will be collected using a clean trowel and placed into laboratory provided sample containers. Composite aliquots will be collected by equal volumes from each subsample location, thoroughly mixed, and then containerized.
- Collect up to three (3) grab samples at the sampler's discretion from atypical areas of the stockpiled digester solids. If atypical areas are not identified, one (1) grab samples will be collected from the area when yellow liquid was observed coming out of the stockpile in the January 2, 2019 site visit.

A handheld GPS (sub-meter) will be used to delineate the perimeter of the stockpiled digester solids and to survey where the stockpile was split for characterization and all grab sampling locations. Site visit activities will be photographed and documented on a Daily Quality Control Report and a Collection Field Sheet.

Samples will be submitted to an off-site fixed laboratory for Volatile Organic Compounds (VOC) analysis in accordance with EPA Method 8260C, RCRA Metals by EPA Method 6010C/7471B, and Semi-Volatile Organic Compounds (SVOC) by EPA Methods 8270D. Analytical results will be provided by the laboratory with a 5-day turnaround time from receipt of samples. Table 1 lists the summary of proposed environmental samples and analytical methods. Rinsate blanks nor other QA/QC samples will not be collected since new disposal equipment will be used to collect each sample.

A brief data report will be prepared and include site photographs, field forms, and analytical data. The cost estimate for this project is included in Attachment A and an NDEQ Generic QAPP Addendum form has been completed and is provided in Attachment B.

Table 1 – Summary of Proposed Samples and Analytical Methods for Groundwater

Matrix	Number of Samples/Parameter	Analytical Methods
Digester Solids	6 / VOCs	EPA Method 8260C
Digester Solids	6 / RCRA Metals	EPA Method 6010C/7471B
Digester Solids	6 / SVOCs	EPA Method 8270D

Subcontracting

This task assignment requires analytical services. EA provided a request for quote to two analytical laboratories. A summary of the quotes received is listed in Table 2 below.

Table 2 – Analytical Laboratory Quote Summary

Laboratory	Total Cost for Analytical Analyses
Pace	\$1,863.00
TestAmerica	\$2,179.50

Attachment A:
Cost Estimate

TOTAL COST SUMMARY

**Nebraska Department of Environmental Quality
TA-19-1A - Big Ox Energy Siouxland LLC
Attachment A - Cost Estimate**

	EA Labor Hours	EA Labor Cost	EA Analytical	EA ODC's	TOTAL
Phase 1 - Work Plan and Cost Estimate	6	\$634.91	\$0.00	\$0.00	\$634.91
Phase 2 - Data Collection and Site Visit	16	\$1,309.40	\$2,008.31	\$547.95	\$3,865.66
Phase 3 - Reporting	10	\$866.32	\$0.00	\$79.60	\$945.92
GRAND TOTAL¹	32	\$2,811	\$2,008	\$628	\$5,446

1 - Rounded to the nearest dollar amount

Nebraska Department of Environmental Quality
 TA-19-1A - Big Ox Energy Siouxland LLC
 Attachment A - Cost Estimate

	Project Manager	Senior Scientist	Project Scientist	Staff Scientist	Secretary 1	Procurement Specialist	TOTAL
Phase 1 - Work Plan and Cost Estimate							
Prepare Work Plan	1	0	4	0	0	1	1
<i>Task Total Hours</i>	1	0	4	0	0	1	6
Phase 2 - Data Collection and Site Visit							
Mobilization	1	0	2	0	0	0	2
Travel	0	0	5	0	0	0	5
Field Work	1	0	5	0	0	0	5
Package and Ship Samples	0	0	2	0	0	0	2
<i>Task Total Hours</i>	2	0	0	14	0	0	16
Phase 3 - Reporting							
Draft Report	0	1	6	0	0	0	6
Final Report	1	0	1	1	1	0	3
<i>Task Total Hours</i>	1	1	7	1	1	0	10
Total All Phases	4	1	4	21	1	1	32

Nebraska Department of Environmental Quality
 TA-19-1A - Big Ox Energy Siouxland LLC
 Attachment A - Cost Estimate
 Phase 1 - Work Plan and Cost Estimate

(1) Direct Labor	Class Code	Hours	Rate	Cost
Principal		0	\$204.44	\$0.00
Project Manager		1	\$142.65	\$142.65
Senior Engineer		0	\$160.35	\$0.00
Project Engineer		0	\$109.91	\$0.00
Staff Engineer		0	\$84.22	\$0.00
Senior Geologist		0	\$135.68	\$0.00
Project Geologist		0	\$99.49	\$0.00
Staff Geologist		0	\$77.61	\$0.00
Senior Hydrogeologist		0	\$169.86	\$0.00
Project Hydrogeologist		0	\$122.49	\$0.00
Staff Hydrogeologist		0	\$81.15	\$0.00
Senior Scientist		0	\$155.63	\$0.00
Project Scientist		4	\$98.36	\$393.44
Staff Scientist		0	\$73.15	\$0.00
Secretary 1		0	\$55.99	\$0.00
CADD Draftsman		0	\$77.91	\$0.00
Site / Construction Supervisor		0	\$98.83	\$0.00
Procurement Specialist		1	\$98.82	\$98.82
Field Technician		0	\$65.01	\$0.00
Subtotal Direct Labor		6		\$634.91
Subtotal Direct Labor				\$634.91
(2) Subcontractors	Units	No. of Units	Rate	Cost
EDR Report	LS	0	\$350.00	\$0.00
Title Search	LS	0	\$450.00	\$0.00
LBP and ACM Surveys	LS	0	\$1.00	\$0.00
Drilling	LS	0	\$1.00	\$0.00
Subtotal Subcontractors		0		\$0.00
G & A @ 7.80%				\$0.00
Subtotal Subcontractors				\$0.00
(3) Other Direct Costs (ODC's)	Units	No. of Units	Rate	Cost
Soil Auger Kit (Hand Operated)	Day(s)	0	\$16.01	\$0.00
Trimble GeoXT	Day(s)	0	\$87.06	\$0.00
Turbidity Meter	Day(s)	0	\$43.11	\$0.00
Water Level Meter - Solinst 101/QED /Soil Test	Day(s)	0	\$30.78	\$0.00
YSI-556	Day(s)	0	\$87.06	\$0.00
Mini-Rae Survey Mode PID	Day(s)	0	\$92.37	\$0.00
Peristaltic Pump	Day(s)	0	\$43.11	\$0.00
Submersible Pump	Day(s)	0	\$40.63	\$0.00
Trash/Waste Pump	Day(s)	0	\$31.20	\$0.00
Passenger Car	Day(s)	0	\$65.45	\$0.00
Truck/SUV (1/2 ton or smaller)	Day(s)	0	\$68.49	\$0.00
Large Truck/SUV (3/4 ton or larger)	Day(s)	0	\$81.74	\$0.00
Passenger Car, Mileage	Mile(s)	0	\$0.27	\$0.00
Truck/SUV (1/2 ton or smaller), Mileage	Mile(s)	0	\$0.33	\$0.00
Large Truck/SUV (3/4 ton or larger), Mileage	Mile(s)	0	\$0.41	\$0.00
Schonstedt/White's Magnetometer	Day(s)	0	\$18.35	\$0.00
Report Preparation Materials (per inch of report)	Inch	0	\$24.12	\$0.00
Electric Concrete Core Drill	Day(s)	0	\$73.89	\$0.00
QED MP-10H - Micro Purge Control	Day(s)	0	\$30.78	\$0.00
Sample Shipping (per cooler)	Each	0	\$150.00	\$0.00
Drum	Each	0	\$64.76	\$0.00
Sampling Supplies	LS	0	\$1.00	\$0.00
IDW Disposal	LS	0	\$1.00	\$0.00
QED MP-10 - Micro Purge Control	Day(s)	0	\$120.00	\$0.00
12 Volt Air Compressor	Each	0	\$960.00	\$0.00
Hydrasleeve	Each	0	\$45.00	\$0.00
Subtotal ODC's		0		\$0.00
Subtotal ODC's				\$0.00
(4) Travel	Units	No. of Units	Rate	Cost
Airfare	R/T	0	\$1.00	\$0.00
Lodging	day	0	\$94.00	\$0.00
Meals and Incidentals	day	0	\$55.00	\$0.00
Mileage (POV)	mile	0	\$0.575	\$0.00
Subtotal Travel		0		\$0.00
Subtotal Travel and G & A				\$0.00
(5) Analytical	Units	No. of Units	Rate	Cost
VOCs (Method 8260C)	per sample	0	\$65.00	\$0.00
SVOCs (Method 8270D)	per sample	0	\$170.00	\$0.00
RCRA Metals	per sample	0	\$74.00	\$0.00
Laboratory Impact Fee	per sample	0	\$9.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$2.00	\$0.00
Subtotal Analytical		0		\$0.00
G & A @ 7.80%				\$0.00
Subtotal Analytical				\$0.00
TOTAL ESTIMATED PROJECT COSTS				\$634.91

Nebraska Department of Environmental Quality
 TA-19-1A - Big Ox Energy Siouxland LLC
 Attachment A - Cost Estimate
 Phase 2 - Data Collection and Site Visit

(1) Direct Labor	Class Code	Hours	Rate	Cost
Principal		0	\$204.44	\$0.00
Project Manager		2	\$142.65	\$285.30
Senior Engineer		0	\$160.35	\$0.00
Project Engineer		0	\$109.91	\$0.00
Staff Engineer		0	\$84.22	\$0.00
Senior Geologist		0	\$135.68	\$0.00
Project Geologist		0	\$99.49	\$0.00
Staff Geologist		0	\$77.61	\$0.00
Senior Hydrogeologist		0	\$169.86	\$0.00
Project Hydrogeologist		0	\$122.49	\$0.00
Staff Hydrogeologist		0	\$81.15	\$0.00
Senior Scientist		0	\$155.63	\$0.00
Project Scientist		0	\$98.36	\$0.00
Staff Scientist		14	\$73.15	\$1,024.10
Secretary 1		0	\$55.99	\$0.00
CADD Draftsman		0	\$77.91	\$0.00
Site / Construction Supervisor		0	\$98.83	\$0.00
Procurement Specialist		0	\$98.82	\$0.00
Field Technician		0	\$65.01	\$0.00
Subtotal Direct Labor		16		\$1,309.40
Subtotal Direct Labor				\$1,309.40
(2) Subcontractors	Units	No. of Units	Rate	Cost
EDR Report	LS	0	\$350.00	\$0.00
Title Search	LS	0	\$450.00	\$0.00
LBP and ACM Surveys	LS	0	\$1.00	\$0.00
Drilling	LS	0	\$1.00	\$0.00
Subtotal Subcontractors		0		\$0.00
G & A @ 7.80%				\$0.00
Subtotal Subcontractors				\$0.00
(3) Other Direct Costs (ODC's)	Units	No. of Units	Rate	Cost
Soil Auger Kit (Hand Operated)	Day(s)	0	\$16.01	\$0.00
Trimble GeoXT	Day(s)	1	\$87.06	\$87.06
Turbidity Meter	Day(s)	0	\$43.11	\$0.00
Water Level Meter - Solinst 101/QED /Soil Test	Day(s)	0	\$30.78	\$0.00
YSI-556	Day(s)	0	\$87.06	\$0.00
Mini-Rae Survey Mode PID	Day(s)	0	\$92.37	\$0.00
Peristaltic Pump	Day(s)	0	\$43.11	\$0.00
Submersible Pump	Day(s)	0	\$40.63	\$0.00
Trash/Waste Pump	Day(s)	0	\$31.20	\$0.00
Passenger Car	Day(s)	0	\$65.45	\$0.00
Truck/SUV (1/2 ton or smaller)	Day(s)	1	\$68.49	\$68.49
Large Truck/SUV (3/4 ton or larger)	Day(s)	0	\$81.74	\$0.00
Passenger Car, Mileage	Mile(s)	0	\$0.27	\$0.00
Truck/SUV (1/2 ton or smaller), Mileage	Mile(s)	280	\$0.33	\$92.40
Large Truck/SUV (3/4 ton or larger), Mileage	Mile(s)	0	\$0.41	\$0.00
Schonstedt/White's Magnetometer	Day(s)	0	\$18.35	\$0.00
Report Preparation Materials (per inch of report)	Inch	0	\$24.12	\$0.00
Electric Concrete Core Drill	Day(s)	0	\$73.89	\$0.00
QED MP-10H - Micro Purge Control	Day(s)	0	\$30.78	\$0.00
Sample Shipping (per cooler)	Each	1	\$150.00	\$150.00
Drum	Each	0	\$64.76	\$0.00
Sampling Supplies	LS	150	\$1.00	\$150.00
IDW Disposal	LS	0	\$1.00	\$0.00
QED MP-10 - Micro Purge Control	Day(s)	0	\$120.00	\$0.00
12 Volt Air Compressor	Each	0	\$960.00	\$0.00
Hydrasleeve	Each	0	\$45.00	\$0.00
Subtotal ODC's		433		\$547.95
Subtotal ODC's				\$547.95
(4) Travel	Units	No. of Units	Rate	Cost
Airfare	R/T	0	\$1.00	\$0.00
Lodging	day	0	\$94.00	\$0.00
Meals and Incidentals	day	0	\$55.00	\$0.00
Mileage (POV)	mile	0	\$0.575	\$0.00
Subtotal Travel		0		\$0.00
Subtotal Travel and G & A				\$0.00
(5) Analytical	Units	No. of Units	Rate	Cost
VOCs (Method 8260C)	per sample	6	\$65.00	\$390.00
SVOCs (Method 8270D)	per sample	6	\$170.00	\$1,020.00
RCRA Metals	per sample	6	\$74.00	\$444.00
Laboratory Impact Fee	per sample	1	\$9.00	\$9.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$2.00	\$0.00
Subtotal Analytical		19		\$1,863.00
G & A @ 7.80%				\$145.31
Subtotal Analytical				\$2,008.31
TOTAL ESTIMATED PROJECT COSTS				\$3,865.66

Nebraska Department of Environmental Quality
 TA-19-1A - Big Ox Energy Siouxland LLC
 Attachment A - Cost Estimate
 Phase 3 - Reporting

(1) Direct Labor	Class Code	Hours	Rate	Cost
Principal		0	\$204.44	\$0.00
Project Manager		1	\$142.65	\$142.65
Senior Engineer		0	\$160.35	\$0.00
Project Engineer		0	\$109.91	\$0.00
Staff Engineer		0	\$84.22	\$0.00
Senior Geologist		0	\$135.68	\$0.00
Project Geologist		0	\$99.49	\$0.00
Staff Geologist		0	\$77.61	\$0.00
Senior Hydrogeologist		0	\$169.86	\$0.00
Project Hydrogeologist		0	\$122.49	\$0.00
Staff Hydrogeologist		0	\$81.15	\$0.00
Senior Scientist		1	\$155.63	\$155.63
Project Scientist		0	\$98.36	\$0.00
Staff Scientist		7	\$73.15	\$512.05
Secretary 1		1	\$55.99	\$55.99
CADD Draftsman		0	\$77.91	\$0.00
Site / Construction Supervisor		0	\$98.83	\$0.00
Procurement Specialist		0	\$98.82	\$0.00
Field Technician		0	\$65.01	\$0.00
Subtotal Direct Labor		10		\$866.32
Subtotal Direct Labor				\$866.32
(2) Subcontractors	Units	No. of Units	Rate	Cost
EDR Report	LS	0	\$350.00	\$0.00
Title Search	LS	0	\$450.00	\$0.00
LBP and ACM Surveys	LS	0	\$1.00	\$0.00
Drilling	LS	0	\$1.00	\$0.00
Subtotal Subcontractors		0		\$0.00
G & A @ 7.80%				\$0.00
Subtotal Subcontractors				\$0.00
(3) Other Direct Costs (ODC's)	Units	No. of Units	Rate	Cost
Soil Auger Kit (Hand Operated)	Day(s)	0	\$16.01	\$0.00
Trimble GeoXT	Day(s)	0	\$87.06	\$0.00
Turbidity Meter	Day(s)	0	\$43.11	\$0.00
Water Level Meter - Solinst 101/QED /Soil Test	Day(s)	0	\$30.78	\$0.00
YSI-556	Day(s)	0	\$87.06	\$0.00
Mini-Rae Survey Mode PID	Day(s)	0	\$92.37	\$0.00
Peristaltic Pump	Day(s)	0	\$43.11	\$0.00
Submersible Pump	Day(s)	0	\$40.63	\$0.00
Trash/Waste Pump	Day(s)	0	\$31.20	\$0.00
Passenger Car	Day(s)	0	\$65.45	\$0.00
Truck/SUV (1/2 ton or smaller)	Day(s)	0	\$68.49	\$0.00
Large Truck/SUV (3/4 ton or larger)	Day(s)	0	\$81.74	\$0.00
Passenger Car, Mileage	Mile(s)	0	\$0.27	\$0.00
Truck/SUV (1/2 ton or smaller), Mileage	Mile(s)	0	\$0.33	\$0.00
Large Truck/SUV (3/4 ton or larger), Mileage	Mile(s)	0	\$0.41	\$0.00
Schonstedt/White's Magnetometer	Day(s)	0	\$18.35	\$0.00
Report Preparation Materials (per inch of report)	Inch	3	\$24.12	\$79.60
Electric Concrete Core Drill	Day(s)	0	\$73.89	\$0.00
QED MP-10H - Micro Purge Control	Day(s)	0	\$30.78	\$0.00
Sample Shipping (per cooler)	Each	0	\$150.00	\$0.00
Drum	Each	0	\$64.76	\$0.00
Sampling Supplies	LS	0	\$1.00	\$0.00
IDW Disposal	LS	0	\$1.00	\$0.00
QED MP-10 - Micro Purge Control	Day(s)	0	\$120.00	\$0.00
12 Volt Air Compressor	Each	0	\$960.00	\$0.00
Hydrasleeve	Each	0	\$45.00	\$0.00
Subtotal ODC's		3		\$79.60
Subtotal ODC's				\$79.60
(4) Travel	Units	No. of Units	Rate	Cost
Airfare	R/T	0	\$1.00	\$0.00
Lodging	day	0	\$94.00	\$0.00
Meals and Incidentals	day	0	\$55.00	\$0.00
Mileage (POV)	mile	0	\$0.575	\$0.00
Subtotal Travel		0		\$0.00
Subtotal Travel and G & A				\$0.00
(5) Analytical	Units	No. of Units	Rate	Cost
VOCs (Method 8260C)	per sample	0	\$65.00	\$0.00
SVOCs (Method 8270D)	per sample	0	\$170.00	\$0.00
RCRA Metals	per sample	0	\$74.00	\$0.00
Laboratory Impact Fee	per sample	0	\$9.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$1.00	\$0.00
[Blank]	per sample	0	\$2.00	\$0.00
Subtotal Analytical		0		\$0.00
G & A @ 7.80%				\$0.00
Subtotal Analytical				\$0.00
TOTAL ESTIMATED PROJECT COSTS				\$945.92

Attachment B:
Nebraska Department of Environmental Quality
Site-Specific Quality Assurance Project Plan (QAPP) Addendum

NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY
SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN (QAPP) ADDENDUM
SUPERFUND SITE ASSESSMENT & SECTION 128(a) ASSESSMENT PROGRAMS

Note: This Addendum supplements the Generic QAPP for Superfund Site Assessment and Section 128(a) Assessment activities (Revised January 2016) and includes documentation only for the specific site/project indicated. The Addendum is only necessary for projects with sampling requirements needed to accomplish site assessment activities.

1. SITE NAME AND LOCATION:

Name: Big Ox energy Siouxland, LLC

Address or Other Location Identifier: 1616 D Avenue

City: Dakota City	County: Dakota	State: NE	ZIP: 68731
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Site Point of Contact (POC) Name: Wade Gregson	POC Email: s Wade.gregson@nebraska.gov
---	--

Telephone: (402) 471-3377	FAX: N/A
----------------------------------	-----------------

Directions to Site: See attached figure (Figure 1)	Map(s) attached: No
---	----------------------------

2. PROJECT MANAGEMENT AND PROJECT INFORMATION:

Distribution List (Check as appropriate and identify):

- | | |
|--|---|
| <input checked="" type="checkbox"/> NDEQ Section/Unit Supervisor(s): Mike Felix | <input checked="" type="checkbox"/> NDEQ QA Manager: Mark Lohnes |
| <input type="checkbox"/> NDEQ Program Coordinator: | <input checked="" type="checkbox"/> NDEQ Project Manager(s): Wade Gregson |
| <input checked="" type="checkbox"/> Contractor Project Manager (Specify): Dan Bigbee | <input type="checkbox"/> Other (Specify): |

2.1 Project and Task Organization (Check as appropriate and identify):

- | | |
|--|---|
| <input checked="" type="checkbox"/> NDEQ Project Manager: Scott Summerside | <input checked="" type="checkbox"/> NDEQ QA Manager: Mark Lohnes |
| <input checked="" type="checkbox"/> Contractor Project Manager: Dan Bigbee | <input checked="" type="checkbox"/> Site Safety Officer: Kent Dixon |

2.2 Problem Definition and Background: (Check to indicate items are attached)

- | | |
|--|---|
| <input type="checkbox"/> Discussion of site-specific conditions | <input type="checkbox"/> Table indicating maximum concentrations detected |
| <input type="checkbox"/> Maps and Figures | <input type="checkbox"/> Table indicating concentrations of concern |
| <input checked="" type="checkbox"/> Table indicating number and types of field and QC samples to be collected | |
| <input type="checkbox"/> Discussion of laboratory deviations from latest version of EPA SOP 2440.5 (if applicable) | |

2.3 Project and Task Description/Type(s) (Check as appropriate):

- | | |
|---|---|
| <input type="checkbox"/> Pre-CERCLIS Site Screening Assessment (PCSSA) | <input type="checkbox"/> Preliminary Assessment (PA) |
| <input type="checkbox"/> Abbreviated Preliminary Assessment (APA) | <input type="checkbox"/> Site Inspection (SI) |
| <input type="checkbox"/> Expanded Site Inspection (ESI) | <input type="checkbox"/> Focused Site Inspection (FSI) |
| <input type="checkbox"/> Section 128(a) Assessment - Phase I Investigation | <input type="checkbox"/> Site Re-Assessment (SR or SI-2) |
| <input type="checkbox"/> Section 128(a) Assessment - Phase II Investigation | <input checked="" type="checkbox"/> Other (Specify and attach description): Complaint Sample of stockpiled digester solids at the site. |

2.4 Quality Objectives and Criteria for Measurement Data: (Check appropriate boxes)

- | | | |
|----------------------------|---|---|
| Accuracy: | <input checked="" type="checkbox"/> According to Generic Site Assessment QAPP | <input type="checkbox"/> Identified in attached table |
| Precision | <input checked="" type="checkbox"/> According to Generic Site Assessment QAPP | <input type="checkbox"/> Identified in attached table |
| Representativeness: | <input checked="" type="checkbox"/> According to Generic Site Assessment QAPP | <input type="checkbox"/> Identified in attached table |
| Completeness: [*] | <input checked="" type="checkbox"/> According to Generic Site Assessment QAPP | <input type="checkbox"/> Identified in attached table |
| Comparability: | <input checked="" type="checkbox"/> According to Generic Site Assessment QAPP | <input type="checkbox"/> Identified in attached table |

*A completeness goal of 100 % has been established for this project. However, a site disposition may still be possible from the remaining valid data.

Critical sample locations are included in (check all that apply):

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> Attached Table(s) | <input type="checkbox"/> Attached Map(s) | <input checked="" type="checkbox"/> Work Plan | <input type="checkbox"/> Other (Describe): |
|--|--|---|--|

NDEQ SITE-SPECIFIC QAPP ADDENDUM FORM

collect composite samples

2.5 Special Training/Certification Requirements: (Check appropriate boxes)

- | | |
|---|--|
| <input checked="" type="checkbox"/> OSHA 40-hour (HAZWOPER) | <input type="checkbox"/> Direct Push Probe/Geoprobe Operator |
| <input type="checkbox"/> Mobile GC Field Analyst | <input type="checkbox"/> In-Field XRF Operator |
| <input type="checkbox"/> Water Well Monitoring Supervisor and/or Technician | <input type="checkbox"/> Water Well Drilling Contractor and/or Drilling Supervisor |
| <input type="checkbox"/> Pump Installation Contractor and/or Supervisor | <input type="checkbox"/> Drill Rig Operator |
| <input type="checkbox"/> Other (specify): | |

2.6 Documentation And Records Proposed For Project: (Check appropriate boxes):

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Project Work Plan | <input checked="" type="checkbox"/> Log Book/Field Notes | <input type="checkbox"/> Drilling permit(s) |
| <input checked="" type="checkbox"/> Health and Safety Plan | <input checked="" type="checkbox"/> Field Sheets | <input checked="" type="checkbox"/> GPS Coordinates |
| <input checked="" type="checkbox"/> Site Maps/Figures | <input checked="" type="checkbox"/> Chain-of-Custody | <input type="checkbox"/> Licensed surveyor site map |
| <input checked="" type="checkbox"/> Site Sampling Map (attached) | <input checked="" type="checkbox"/> Site Photographs | <input type="checkbox"/> Calibration Records |
| <input type="checkbox"/> Property Access Agreement | <input type="checkbox"/> Site Videotapes | <input type="checkbox"/> ASTM Phase I ESA Requirements |
| <input type="checkbox"/> Property Ownership Records | <input type="checkbox"/> Utility Clearance Forms | <input type="checkbox"/> ASTM Phase II ESA Requirements |
| <input type="checkbox"/> Daily Tailgate Meeting Forms | | |
| <input type="checkbox"/> Other Documentation (Specify): | | |
| <input checked="" type="checkbox"/> Reports, Deliverables, or Submittals Required (Specify): | Specified in Task Assignment | |

3. DATA GENERATION AND AQUISITION:

3.1 Sampling Process Design

A. General Sampling Approach (Check appropriate boxes):

- Probability Sampling Judgmental Sampling

Sampling Method:

- | | | |
|---|--|--|
| <input type="checkbox"/> Simple Random Sampling | <input type="checkbox"/> Stratified Sampling | <input checked="" type="checkbox"/> Systematic/Grid Sampling |
| <input type="checkbox"/> Ranked Set Sampling | <input type="checkbox"/> Adaptive Cluster Sampling | <input type="checkbox"/> Incremental/Composite Sampling |

B. Screening/Definitive Sampling (Check appropriate boxes):

- Screening without Definitive Confirmation
 Screening with Definitive Confirmation. Confirmation sampling rate of _____ % of field screening samples.
 Definitive Sampling

C. Biased/Judgmental Sampling:

- No (If No, explain the alternate sampling rationale and approach below):
 Yes (If Yes, the text below applies):

Explain below:

The proposed sampling scheme will be judgmental to sample a non-compliant stockpile of digester solids on the subject site. The stockpiling of solids at the subject site is not compliant with its SWPP. Samples will be analyzed to determine if hazardous substance are present in the digester solids. Standard sampling protocols will be used to ensure that samples collected are representative of the stockpiled digester solids. Judgmental sampling is the subjective (biased) selection of sampling locations based on available information, visual inspection, and professional judgment.

NDEQ SITE-SPECIFIC QAPP ADDENDUM FORM

3.2 Sample Methods Requirements (Specify all to be utilized):

Matrix	Sampling Method	Std. Operating Procedures	Sampling Equipment Proposed
<input type="checkbox"/> Soil	_____	_____	_____
<input type="checkbox"/> Soil-Gas	_____	_____	_____
<input type="checkbox"/> Groundwater	_____	_____	_____
<input type="checkbox"/> Surface Water	_____	_____	_____
<input type="checkbox"/> Sediment	_____	_____	_____
<input type="checkbox"/> Waste	_____	_____	_____
<input type="checkbox"/> Leachate	_____	_____	_____
<input type="checkbox"/> Air	_____	_____	_____
<input checked="" type="checkbox"/> Other (specify below):			
Digester Solids	4231_2006, 2420.4C 2420.7D, 2420.12C,	SOP 2012 Soil Sampling	Pick, shovel, hand trowel

3.3 Sample Handling and Custody Requirements (Check appropriate boxes):

- In accordance with Generic QAPP and SOPs Use Analytical Laboratory Chain of Custody Form(s)
 Other (specify): _____

3.4 Analytical Methods Requirements (Check appropriate box):

- Identified in Attached Table(s) Other (Describe): _____

3.5 Quality Control Requirements (Check all appropriate boxes):

- Not Applicable In accordance with Generic QAPP
 Specific requirements (state): As directed by NDEQ

Field QC Samples to be collected:

- | | | |
|---|----------------------------|----------------------------------|
| <input type="checkbox"/> Duplicates* | (frequency 1 per 20) | Prepared by: Field Personnel |
| <input type="checkbox"/> Trip Blanks (VOCs) | (frequency One per cooler) | Prepared by: Contract Laboratory |
| <input type="checkbox"/> Field Blanks* | (frequency one) | Prepared by: Contract Laboratory |
| <input type="checkbox"/> Equipment Rinsate Blanks | (frequency) | Prepared by: (Select) |
| <input type="checkbox"/> Split Samples | (frequency) | Splits go to: |
| <input type="checkbox"/> Others (specify) | (frequency) | |

* The requirement for and frequency of field duplicates and field blanks must be established for each project.

3.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements (Check appropriate box):

- Not Applicable In accordance with Generic QAPP
 Specific field or laboratory equipment requirements:
 Instrument: Testing, Inspection, or Maintenance Frequency:
 Instrument: Testing, Inspection, or Maintenance Frequency:
 Instrument: Testing, Inspection, or Maintenance Frequency:
 Critical Spare Parts Required: _____

3.7 Instrument/Equipment Calibration and Frequency (Check appropriate box):

- Not Applicable In accordance with Generic QAPP
 Specific field equipment requirements:
 Instrument: Calibration Frequency:
 Instrument: Calibration Frequency:
 Instrument: Calibration Frequency:
 Instrument: Calibration Frequency:

NDEQ SITE-SPECIFIC QAPP ADDENDUM FORM

3.8 Inspection/Acceptance Criteria for Supplies and Consumables (Check appropriate box):

- Not Applicable In accordance with Generic QAPP
 Specific requirements (state):

3.9 Data Acquisition Requirements for Non-Direct Measurements (Check appropriate box):

- Not Applicable In accordance with Generic QAPP
 Specific requirements (state):

3.10 Data Management (Check appropriate box):

- In accordance with Generic QAPP Specific requirements (state):

4. ASSESSMENT AND OVERSIGHT:

4.1A Assessment and Response Actions (Check all appropriate boxes):

- Peer Review Management Review Field Audit Lab Audit
 Those pertaining to analytical phases of the project will be in accordance with the contracted commercial Analytical Laboratory internal SOPs
 Specific requirements (state):

4.1B Corrective Action (Check appropriate box):

- In accordance with Generic QAPP Specific requirements (state):

4.2 Reports to Management / Assessment Reporting (Check appropriate boxes):

- In accordance with Generic QAPP
 In accordance with ASTM E-1527-13 Phase I Environmental Site Assessment
 In accordance with ASTM E-1903-11 Phase II Environmental Site Assessment
 Specific requirements (state):

5. DATA VALIDATION AND USABILITY:

5.1 Data Review, Verification, and Validation Requirements (Check appropriate box):

- Data review and verification will be performed by Project Manager or QC officer delegate in accordance with Generic QAPP, with data validation conducted according to Generic QAPP.
 Data review, validation and verification will be performed as follows with data validation conducted according to alternate methods (describe):

Field analysis utilized? No (If yes, memorandum, field analytical sheets, etc. from field analyst should be reviewed by Project Manager and/or Site QC Officer after completion of field analysis).

5.2 Verification and Validation Methods (Check appropriate box):

- In accordance with Generic QAPP Specific requirements (state):

5.3 Reconciliation with User Requirements—Data Quality Objectives (Check appropriate box):

- In accordance with Generic QAPP Specific requirements (state):

NDEQ SITE-SPECIFIC QAPP ADDENDUM FORM

6. APPROVAL SIGNATURES & DATES:

Note: The QAPP Addendum will not be considered complete until all of the appropriate approval signatures indicated below are obtained. If the QAPP Addendum has to be revised after signatures (some or all) were obtained, new signatures will be required to properly finalize and approve the revised QAPP Addendum.

Dan Bigbee
Contractor Project Manager
(name)



Signature

January 8, 2019
Date

Kent Dixon
Contractor QA Officer/Designee
(name)



Signature

January 8, 2019
Date

Wade Gregson
NDEQ Project Manager/Designee
(name)



Signature

1/8/19
Date

Mike Felix
NDEQ Unit or Section Supervisor
(name)



Signature

1/8/19
Date

APPENDIX B

Photographic Log



Photo 1. View of stockpiled digester solids looking northeast.



Photo 2. View of stockpiled digester solids looking north.



Photo 3. View of stockpiled digester solids looking northwest.



Photo 4. View of stockpiled digester solids looking west.



Photo 5. Composite Sample – DS-1, Subsample 1, Photo 1.



Photo 6. Composite Sample – DS-1, Subsample 1, Photo 2.



Photo 7. Composite Sample – DS-1, Subsample 1, Photo 3.



Photo 8. Composite Sample – DS-1, Subsample 2, Photo 1.



01.11.2019 12:16

Photo 9. Composite Sample – DS-1, Subsample 2, Photo 2.



01.11.2019 12:16

Photo 10. Composite Sample – DS-1, Subsample 2, Photo 3.



Photo 11. Composite Sample – DS-1, Subsample 3, Photo 1.



Photo 12. Composite Sample – DS-1, Subsample 3, Photo 2.



Photo 13. Composite Sample – DS-1, Subsample 3, Photo 3.



Photo 14. Composite Sample – DS-1, Subsample 4, Photo 1.



01.11.2019 12:28

Photo 15. Composite Sample – DS-1, Subsample 4, Photo 2.



01.11.2019 12:45

Photo 16. View of stockpiled digester solids looking south.



Photo 17. Composite Sample - DS-2, Subsample 2.



Photo 18. View of Stockpiled digester solids looking west.



Photo 19. View of stockpiled digester solids looking southwest.



Photo 20. Composite Sample - DS-2, Subsample 3.



Photo 21. Composite Sample - DS-2, Subsample 4.



Photo 22. Composite Sample - DS-2, Subsample 5.



Photo 23. Grab Sample - DS-3, Photo 1.



Photo 24. Grab Sample - DS-3, Photo 2.



Photo 25. Composite Sample - DS-4, Subsample 1 (right).



Photo 26. Composite Sample - DS-4, Subsample 2.



Photo 27. Composite Sample - DS-6, Subsample 4 and 5.



Photo 28. Composite Sample - DS-6, Subsample 1, 2 and 3 (dark line).



Photo 29. Grab Sample - DS-5.



Photo 30. Composite Sample - DS-4, Subsample 4 and 5 (portion of original linear pile).



Photo 31. View of stockpiled digester solids looking east.



Photo 32. View of stockpiled digester solids looking east.



Photo 33. View of paunch pile and runoff containment looking north.



Photo 34. View of paunch pile looking northwest.

APPENDIX C

Collection Field Sheets

DAILY QUALITY CONTROL REPORT

Project Manager: Dan BigbeeProject: Big OX Digester Solid ~~waste sampling~~Date: 11 Jan 19

S	M	T	W	TH	F	S
					X	

Weather	Bright Sun	Clear	Overcast	Rain	Snow
Temp	(To 32)	32-50	50-70	70-85	>85
Wind	(Still)	Moderate	High	Gusty	
Humidity	(Dry)	Moderate	Humid		

NDEQ Personnel on Site: Jason Windhorst, NathanContractors on Site: EA - Frank DoernemanVisitors on Site: NONEWork Performed: Collected 6 digester solid samples. Delimited digester pile for quantity calculation.

Project: Big OX Digester Solid waste sampling Date: 11 Jan 19

Quality Control Activities (including field calibration and duplicate samples collected): NONE

Problems Encountered/Corrective Actions Taken: NONE

Downtime/Standy: NONE

Health and Safety Activities: Safety boots, hard hat, vest, worn while on site.
Due to jagged nature of solids only walked perimeter of pile

Special Notes:

By: Peter J Dunn Date: 11 Jan 19

COLLECTION FIELD SHEET

Project Name Big Ox Energy Digester Solid waste SamplingSample Number DS-1Name and Address of Property Owner Big Ox Energy Siouxland 1616 D Avenue
Dakota City, NESample Location South and east perimeter of pileSample Media Digester solids Sample Depth 1 ftWell I.D. NADate Collected 11 Jan 19 Time Collected 1145Sampling Personnel F. DoerremannSample QC Duplicate: Yes No Duplicate Sample No. NA

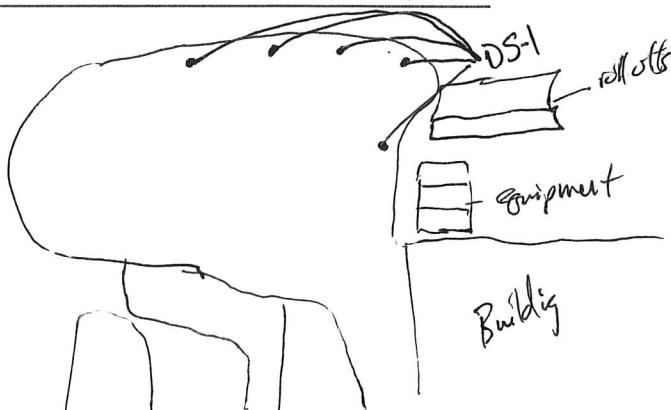
Field Measurements

Photo Ionization Detector Measurements: NApH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
<u>3-4 oz soil jars</u>	<u>Solids</u>	<u>NA/NE</u>	<u>6010/7471 - RCRA metals</u>
			<u>8270 - SVOC</u>
			<u>8260 - VOC</u>

Comments: Composite Sample taken from older solids along perimeter of pile from approximately December 20th 2018 to January 5th 2019

Site Sketch Showing Sampling Location:

N
←

COLLECTION FIELD SHEET

Project Name Big OX Energy Digester Solid waste SamplingSample Number DS - 2Name and Address of Property Owner Big OX Energy Siouxland 1616 D Avenue
Dakota City NESample Location East and north perimeter of pileSample Media Digester Solids Sample Depth 1 ftWell I.D. NADate Collected 11 Jan 19 Time Collected 1210Sampling Personnel F. DoernemanSample QC Duplicate: Yes No Duplicate Sample No. NA

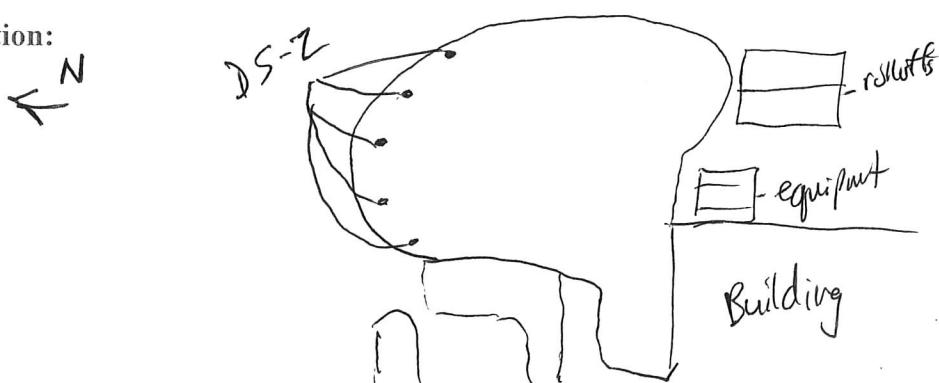
Field Measurements

Photo Ionization Detector Measurements: NApH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
<u>3- 4oz Soil jars</u>	<u>Solids</u>	<u>NONE</u>	<u>10010 / 7471 - RCRA metals</u>
			<u>8270 - SVOC</u>
			<u>82460 - VOC</u>

Comments: Composite Sample taken from older solids along perimeter of pile from approximately December 20th 2018 to January 3rd 2019.

Site Sketch Showing Sampling Location:



COLLECTION FIELD SHEET

Project Name Big Ox Energy Digester Solid waste Sampling

Sample Number DS-3

Name and Address of Property Owner Big Ox Energy Siouxland 1616 D Avenue
Omaha City, NE

Sample Location Central pile from the west

Sample Media Digester Solids Sample Depth 1 ft

Well I.D. NA

Date Collected 11 Jan 19 Time Collected 1235

Sampling Personnel F. Doerreman

Sample QC Duplicate: Yes No Duplicate Sample No. NA

Field Measurements

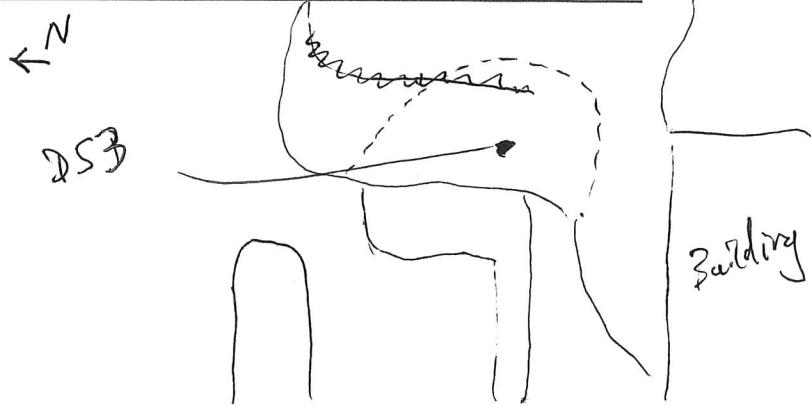
Photo Ionization Detector Measurements: NA

pH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
3-4 oz soil jars	Solids	NONE	10810 / 7471 - RCRA metals
			8270 - SUOC
			82460 - VOC

Comments: grab sample taken from area of solids that was mixed with
Tyson pressed sludge from approximately January 4th-6th 2019

Site Sketch Showing Sampling Location:



COLLECTION FIELD SHEET

Project Name Big OX Energy Digester solid waste SamplingSample Number DS-4Name and Address of Property Owner Big OX Energy Simuland 1600 D AvenueSample Location North of building perimeter and part original linear pileSample Media Digester Solids Sample Depth 1 ftWell I.D. NADate Collected 11 Jan 19Time Collected 1250Sampling Personnel F. OvermanSample QC Duplicate: Yes No Duplicate Sample No. NA

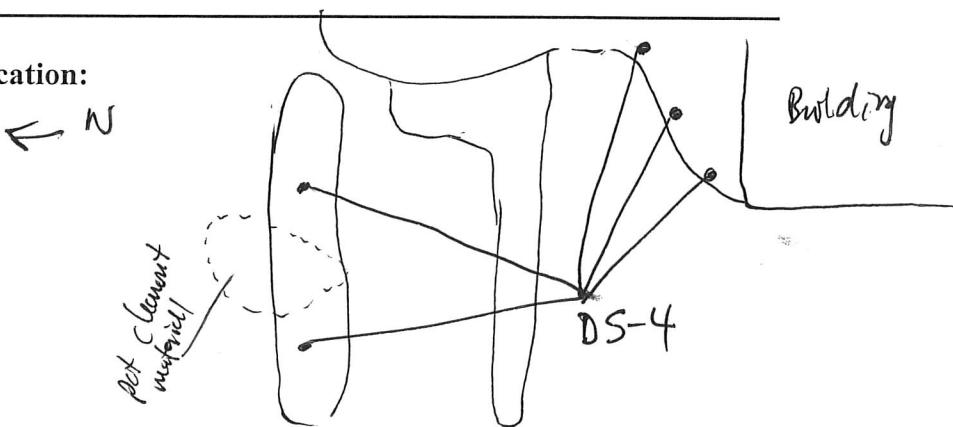
Field Measurements

Photo Ionization Detector Measurements: NApH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
<u>3-4oz soil jars</u>	<u>Solids</u>	<u>none</u>	<u>6010/7471 - RCRA Metals</u>
			<u>8270 - SVOC</u>
			<u>8260 - VOC</u>

Comments: Composite sample collected from older solids along building perimeter and remnants of the original linear pile. Solids dated from approx. December 20th 2018 to January 3rd 2019.

Site Sketch Showing Sampling Location:



COLLECTION FIELD SHEET

Project Name Big OX Energy Digester Solid waste Sampling

Sample Number DS-5

Name and Address of Property Owner Big OX Energy Site 1616 D Avenue

Sample Location North of concrete road near launch pile Dakota City, NE
NW of main pile

Sample Media digester solids Sample Depth 1 ft

Well I.D. NA

Date Collected 11 Jan 2018

Time Collected 1300

Sampling Personnel F. Doerrman

Sample QC Duplicate: Yes No Duplicate Sample No. NA

Field Measurements

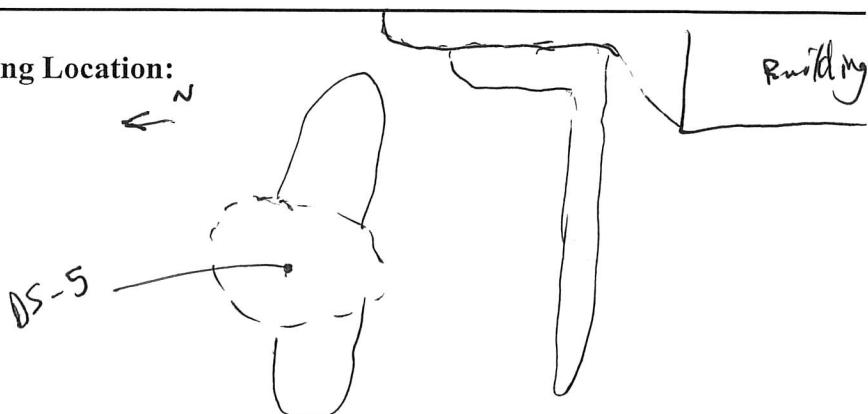
Photo Ionization Detector Measurements: NA

pH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
3-4 oz Soil jars	Solids	None	1010 / 7471 - RCRA metals 82100 - VOC 8270 - SVOC

Comments: grab sample taken from post cleanup material from January 6th 2019
was at wetter consistency therefore stock piled near launch runoff water

Site Sketch Showing Sampling Location:



COLLECTION FIELD SHEET

Project Name Big Ox Digester Solid waste Sampling

Sample Number DS-6

Name and Address of Property Owner Big Ox Energy Siouxland 1616 D Avenue
Dakota City, NE

Sample Location west Perimeter and linear west along road

Sample Media Digester Solids Sample Depth 1 ft

Well I.D. NA

Date Collected 11 Jan 19 Time Collected 1315

Sampling Personnel F. Overman

Sample QC Duplicate: Yes No Duplicate Sample No. NA

Field Measurements

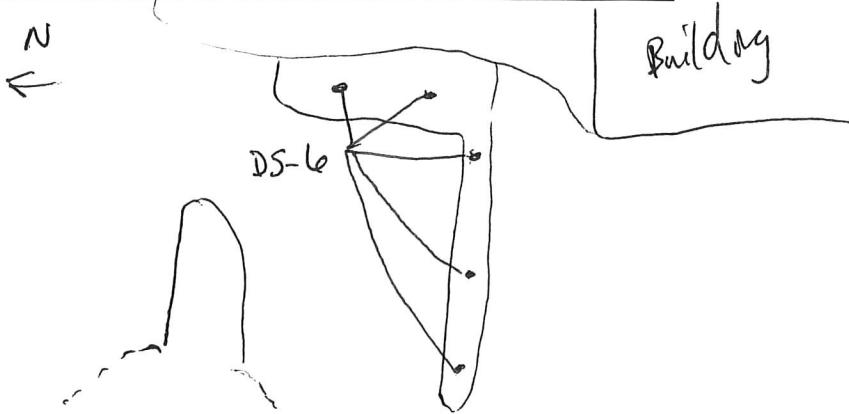
Photo Ionization Detector Measurements: NA

pH NA Conductivity NA Temperature NA

Container	Sample Type	Preservative	Analysis Requested
3-4oz soil jars	Solids	None	leolo / 7471 - RCLL metals 8270 - SVOC 8260 - VOC

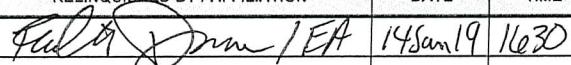
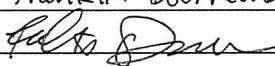
Comments: Composite Sample Collected from the current days solids

Site Sketch Showing Sampling Location:



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Page: / of /						
Company: EA Eng Science and Technology		Report To: Kent Dixon		Attention: Accounts Payable, Kent Dixon								
Address: 221 Sun Valley Blvd Suite D		Copy To: Dan Bigbee		Company Name: EA Eng Science and Technology								
Lincoln, NE 68528				Address:								
Email To: kdixon@eaest.com		Purchase Order No.: LSO #		Pace Quote Reference: 55418 (JR)		REGULATORY AGENCY						
Phone: 402-817-7676 Fax:		Project Name: Big Ox Energy		Pace Project Manager: Trudy Gipson 913-563-1405		<input checked="" type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER						
Requested Due Date/TAT: 5 DAY		Project Number:		Pace Profile #: 12635 Line 1		Site Location	NE					
Section D Required Client Information		Valid Matrix Codes MATRIX CODE (see valid codes to left)		SAMPLE TYPE (G=GRAB C=COMP)		Requested Analysis Filtered (Y/N)						
ITEM #	SAMPLE ID (A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE	COLLECTED										
		MATRIX	CODE	SAMPLE CODE	(G=GRAB C=COMP)	COMPOSITE START	COMPOSITE END/GRAB	SAMPLE TEMP AT COLLECTION	Preservatives	# OF CONTAINERS	Y/N	
				DATE	TIME	DATE	TIME					
1	DS-1	SL	C	11Jan19	1120	11Jan19	1145	3	Unpreserved	H ₂ SO ₄	X	6010/7471 RCRA 8 Metal
2	DS-2	SL	C	11Jan19	1150	11Jan19	1210	3	HNO ₃	HCl	X	8270 SVOC
3	DS-3	SL	G	11Jan19		11Jan19	1235	3	NaOH	Na ₂ S ₂ O ₃	X	8260 VOC
4	DS-4	SL	C	11Jan19	1240	11Jan19	1250	3	Methanol	Other	X	
5	DS-5	SL	G	11Jan19		11Jan19	1300	3			X	
6	DS-6	SL	C	11Jan19	1305	11Jan19	1315	3			X	
7												
8												
9												
10												
11												
12												
ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS		
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219				14Jan19	1630							
SAMPLER NAME AND SIGNATURE												
PRINT Name of SAMPLER: <i>Franklin Doernewan</i>												
SIGNATURE of SAMPLER: 												
DATE Signed (MM/DD/YY): 01/14/19												
Temp in °C												
Received on Ice (Y/N)												
Custody Sealed Cooler (Y/N)												
Samples Intact (Y/N)												

APPENDIX D
Analytical Results

January 22, 2019

Mr. Kent Dixon
EA Engineering, Science, and Technology
221 Sun Valley Blvd
Suite D
Lincoln, NE 68528

RE: Project: Big Ox Energy
Pace Project No.: 60291978

Dear Mr. Dixon:

Enclosed are the analytical results for sample(s) received by the laboratory on January 15, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Mr. Dan Bigbee, EA Engineering, Science, and Technology



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Big Ox Energy
Pace Project No.: 60291978

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Arkansas Drinking Water
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Big Ox Energy
Pace Project No.: 60291978

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291978001	DS-1	Solid	01/11/19 11:45	01/15/19 09:40
60291978002	DS-2	Solid	01/11/19 12:10	01/15/19 09:40
60291978003	DS-3	Solid	01/11/19 12:35	01/15/19 09:40
60291978004	DS-4	Solid	01/11/19 12:50	01/15/19 09:40
60291978005	DS-5	Solid	01/11/19 13:00	01/15/19 09:40
60291978006	DS-6	Solid	01/11/19 13:15	01/15/19 09:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Big Ox Energy
Pace Project No.: 60291978

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291978001	DS-1	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K
60291978002	DS-2	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K
60291978003	DS-3	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K
60291978004	DS-4	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K
60291978005	DS-5	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K
60291978006	DS-6	EPA 6010	EMR	7	PASI-K
		EPA 7471	HKC	1	PASI-K
		EPA 8270	JMT	73	PASI-K
		EPA 8260	JTK	69	PASI-K
		ASTM D2974	DWC	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Big Ox Energy
Pace Project No.: 60291978

Lab Sample ID	Client Sample ID						
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers	
60291978001	DS-1						
EPA 6010	Barium	63.4	mg/kg	2.0	01/17/19 13:07		
EPA 6010	Chromium	137	mg/kg	2.0	01/17/19 13:07		
EPA 6010	Lead	3.1	mg/kg	2.0	01/17/19 13:07		
EPA 6010	Selenium	2.3J	mg/kg	6.0	01/17/19 13:07		
EPA 8270	3&4-Methylphenol(m&p Cresol)	40600	ug/kg	7890	01/17/19 22:01	M1	
EPA 8270	Phenol	21000	ug/kg	7890	01/17/19 22:01	M1	
EPA 8260	Acetone	7130	ug/kg	95.7	01/18/19 15:59		
EPA 8260	2-Butanone (MEK)	129	ug/kg	47.8	01/18/19 15:59		
EPA 8260	n-Butylbenzene	7.0J	ug/kg	23.9	01/18/19 15:59		
EPA 8260	sec-Butylbenzene	5.1J	ug/kg	23.9	01/18/19 15:59		
EPA 8260	Carbon disulfide	25.7	ug/kg	23.9	01/18/19 15:59		
EPA 8260	Ethylbenzene	17.9J	ug/kg	23.9	01/18/19 15:59		
EPA 8260	p-Isopropyltoluene	469	ug/kg	23.9	01/18/19 15:59		
EPA 8260	Methylene chloride	16.0J	ug/kg	23.9	01/18/19 15:59		
EPA 8260	Naphthalene	20.1J	ug/kg	47.8	01/18/19 15:59		
EPA 8260	Toluene	325	ug/kg	23.9	01/18/19 15:59		
EPA 8260	1,2,3-Trichlorobenzene	102	ug/kg	23.9	01/18/19 15:59		
EPA 8260	1,2,4-Trichlorobenzene	7.9J	ug/kg	23.9	01/18/19 15:59		
EPA 8260	1,2,4-Trimethylbenzene	15.1J	ug/kg	23.9	01/18/19 15:59		
ASTM D2974	Percent Moisture	79.3	%	0.50	01/16/19 14:15		
60291978002	DS-2						
EPA 6010	Arsenic	2.3J	mg/kg	2.6	01/17/19 13:09		
EPA 6010	Barium	78.7	mg/kg	1.3	01/17/19 13:09		
EPA 6010	Chromium	94.1	mg/kg	1.3	01/17/19 13:09		
EPA 6010	Lead	3.6	mg/kg	1.3	01/17/19 13:09		
EPA 6010	Selenium	1.9J	mg/kg	4.0	01/17/19 13:09		
EPA 8270	4-Chloro-3-methylphenol	26500	ug/kg	12600	01/17/19 22:22		
EPA 8270	3&4-Methylphenol(m&p Cresol)	47500	ug/kg	6280	01/17/19 22:22		
EPA 8270	Phenol	22100	ug/kg	6280	01/17/19 22:22		
EPA 8260	Acetone	2860	ug/kg	77.7	01/18/19 16:15		
EPA 8260	2-Butanone (MEK)	571	ug/kg	38.9	01/18/19 16:15		
EPA 8260	n-Butylbenzene	4.8J	ug/kg	19.4	01/18/19 16:15		
EPA 8260	Carbon disulfide	14.7J	ug/kg	19.4	01/18/19 16:15		
EPA 8260	Isopropylbenzene (Cumene)	8.7J	ug/kg	19.4	01/18/19 16:15		
EPA 8260	p-Isopropyltoluene	126	ug/kg	19.4	01/18/19 16:15		
EPA 8260	Toluene	681	ug/kg	19.4	01/18/19 16:15		
EPA 8260	1,2,3-Trichlorobenzene	23.9	ug/kg	19.4	01/18/19 16:15		
EPA 8260	1,2,4-Trimethylbenzene	4.4J	ug/kg	19.4	01/18/19 16:15		
ASTM D2974	Percent Moisture	74.0	%	0.50	01/16/19 14:15		
60291978003	DS-3						
EPA 6010	Arsenic	2.4J	mg/kg	4.4	01/17/19 13:11		
EPA 6010	Barium	65.2	mg/kg	2.2	01/17/19 13:11		
EPA 6010	Chromium	138	mg/kg	2.2	01/17/19 13:11		
EPA 6010	Lead	2.4	mg/kg	2.2	01/17/19 13:11		
EPA 8270	3&4-Methylphenol(m&p Cresol)	109000	ug/kg	39600	01/22/19 02:47		
EPA 8270	Phenol	25600	ug/kg	7920	01/17/19 22:44		

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Big Ox Energy
Pace Project No.: 60291978

Lab Sample ID	Client Sample ID						
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers	
60291978003	DS-3						
EPA 8260	Acetone	5260	ug/kg	97.9	01/18/19 16:31		
EPA 8260	2-Butanone (MEK)	1290	ug/kg	49.0	01/18/19 16:31		
EPA 8260	n-Butylbenzene	9.5J	ug/kg	24.5	01/18/19 16:31		
EPA 8260	sec-Butylbenzene	4.9J	ug/kg	24.5	01/18/19 16:31		
EPA 8260	Carbon disulfide	32.9	ug/kg	24.5	01/18/19 16:31		
EPA 8260	Isopropylbenzene (Cumene)	76.5	ug/kg	24.5	01/18/19 16:31		
EPA 8260	p-Isopropyltoluene	986	ug/kg	24.5	01/18/19 16:31		
EPA 8260	Naphthalene	24.4J	ug/kg	49.0	01/18/19 16:31		
EPA 8260	Toluene	10800	ug/kg	1210	01/21/19 16:30		
EPA 8260	1,2,3-Trichlorobenzene	132	ug/kg	24.5	01/18/19 16:31		
EPA 8260	1,2,4-Trichlorobenzene	8.2J	ug/kg	24.5	01/18/19 16:31		
EPA 8260	1,2,4-Trimethylbenzene	19.0J	ug/kg	24.5	01/18/19 16:31		
EPA 8260	1,3,5-Trimethylbenzene	4.9J	ug/kg	24.5	01/18/19 16:31		
ASTM D2974	Percent Moisture	79.5	%	0.50	01/16/19 14:15		
60291978004	DS-4						
EPA 6010	Barium	66.1	mg/kg	2.1	01/17/19 13:20		
EPA 6010	Cadmium	0.39J	mg/kg	2.1	01/17/19 13:20		
EPA 6010	Chromium	144	mg/kg	2.1	01/17/19 13:20		
EPA 6010	Lead	3.1	mg/kg	2.1	01/17/19 13:20		
EPA 8270	3&4-Methylphenol(m&p Cresol)	20500	ug/kg	7550	01/17/19 23:06		
EPA 8270	Phenol	16400	ug/kg	7550	01/17/19 23:06		
EPA 8260	Acetone	6070	ug/kg	91.7	01/21/19 12:51		
EPA 8260	2-Butanone (MEK)	251	ug/kg	45.9	01/21/19 12:51		
EPA 8260	n-Butylbenzene	8.4J	ug/kg	22.9	01/21/19 12:51		
EPA 8260	Carbon disulfide	21.5J	ug/kg	22.9	01/21/19 12:51		
EPA 8260	1,2-Dibromo-3-chloropropane	24.7J	ug/kg	45.9	01/21/19 12:51		
EPA 8260	2-Hexanone	16.0J	ug/kg	91.7	01/21/19 12:51		
EPA 8260	Isopropylbenzene (Cumene)	38.5	ug/kg	22.9	01/21/19 12:51		
EPA 8260	p-Isopropyltoluene	513	ug/kg	22.9	01/21/19 12:51		
EPA 8260	Naphthalene	37.0J	ug/kg	45.9	01/21/19 12:51		
EPA 8260	1,1,2,2-Tetrachloroethane	5.1J	ug/kg	22.9	01/21/19 12:51		
EPA 8260	Toluene	2550	ug/kg	1150	01/22/19 11:50		
EPA 8260	1,2,3-Trichlorobenzene	104	ug/kg	22.9	01/21/19 12:51		
EPA 8260	1,2,4-Trimethylbenzene	17.3J	ug/kg	22.9	01/21/19 12:51		
EPA 8260	1,3,5-Trimethylbenzene	5.1J	ug/kg	22.9	01/21/19 12:51		
ASTM D2974	Percent Moisture	78.3	%	0.50	01/16/19 14:15		
60291978005	DS-5						
EPA 6010	Barium	36.2	mg/kg	1.2	01/17/19 13:22		
EPA 6010	Chromium	69.1	mg/kg	1.2	01/17/19 13:22		
EPA 6010	Lead	2.8	mg/kg	1.2	01/17/19 13:22		
EPA 8270	3&4-Methylphenol(m&p Cresol)	35500	ug/kg	5570	01/17/19 23:27		
EPA 8270	Phenol	12700	ug/kg	5570	01/17/19 23:27		
EPA 8260	Acetone	1680	ug/kg	68.4	01/21/19 13:06		
EPA 8260	2-Butanone (MEK)	1560	ug/kg	34.2	01/21/19 13:06		
EPA 8260	n-Butylbenzene	4.0J	ug/kg	17.1	01/21/19 13:06		
EPA 8260	Carbon disulfide	15.2J	ug/kg	17.1	01/21/19 13:06		

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Big Ox Energy
Pace Project No.: 60291978

Lab Sample ID	Client Sample ID						
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers	
60291978005	DS-5						
EPA 8260	2-Hexanone	70.5	ug/kg	68.4	01/21/19 13:06		
EPA 8260	Isopropylbenzene (Cumene)	25.3	ug/kg	17.1	01/21/19 13:06		
EPA 8260	p-Isopropyltoluene	274	ug/kg	17.1	01/21/19 13:06		
EPA 8260	Naphthalene	13.1J	ug/kg	34.2	01/21/19 13:06		
EPA 8260	Toluene	880	ug/kg	17.1	01/21/19 13:06		
EPA 8260	1,2,3-Trichlorobenzene	48.8	ug/kg	17.1	01/21/19 13:06		
EPA 8260	1,2,4-Trichlorobenzene	4.3J	ug/kg	17.1	01/21/19 13:06		
EPA 8260	1,2,4-Trimethylbenzene	10.7J	ug/kg	17.1	01/21/19 13:06		
ASTM D2974	Percent Moisture	70.9	%	0.50	01/16/19 14:15		
60291978006	DS-6						
EPA 6010	Arsenic	2.2J	mg/kg	3.6	01/17/19 13:25		
EPA 6010	Barium	76.1	mg/kg	1.8	01/17/19 13:25		
EPA 6010	Chromium	111	mg/kg	1.8	01/17/19 13:25		
EPA 6010	Lead	2.4	mg/kg	1.8	01/17/19 13:25		
EPA 6010	Selenium	2.0J	mg/kg	5.3	01/17/19 13:25		
EPA 8270	3&4-Methylphenol(m&p Cresol)	84000	ug/kg	15500	01/22/19 03:08		
EPA 8270	Phenol	33300	ug/kg	7760	01/17/19 23:49		
EPA 8260	Acetone	3210	ug/kg	95.1	01/21/19 13:22		
EPA 8260	2-Butanone (MEK)	138	ug/kg	47.6	01/21/19 13:22		
EPA 8260	Carbon disulfide	20.6J	ug/kg	23.8	01/21/19 13:22		
EPA 8260	Isopropylbenzene (Cumene)	33.9	ug/kg	23.8	01/21/19 13:22		
EPA 8260	p-Isopropyltoluene	352	ug/kg	23.8	01/21/19 13:22		
EPA 8260	Naphthalene	13.0J	ug/kg	47.6	01/21/19 13:22		
EPA 8260	1,2,3-Trichlorobenzene	45.5	ug/kg	23.8	01/21/19 13:22		
EPA 8260	1,2,4-Trichlorobenzene	5.1J	ug/kg	23.8	01/21/19 13:22		
EPA 8260	1,2,4-Trimethylbenzene	8.4J	ug/kg	23.8	01/21/19 13:22		
ASTM D2974	Percent Moisture	79.1	%	0.50	01/16/19 14:15		

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: **EPA 6010**
Description: 6010 MET ICP Red. Interference
Client: EA Engineering, Science, and Technology
Date: January 22, 2019

General Information:

6 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 564878

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291962008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2317704)
 - Lead
- MSD (Lab ID: 2317705)
 - Lead

R1: RPD value was outside control limits.

- MSD (Lab ID: 2317705)
 - Lead

Additional Comments:

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: EPA 7471
Description: 7471 Mercury
Client: EA Engineering, Science, and Technology
Date: January 22, 2019

General Information:

6 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 564920

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291978001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2317831)
 - Mercury
- MSD (Lab ID: 2317832)
 - Mercury

R1: RPD value was outside control limits.

- MSD (Lab ID: 2317832)
 - Mercury

Additional Comments:

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: EPA 8270

Description: 8270 MSSV Semivolatiles

Client: EA Engineering, Science, and Technology

Date: January 22, 2019

General Information:

6 samples were analyzed for EPA 8270. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

QC Batch: 564877

P3: Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.

- DS-1 (Lab ID: 60291978001)
- DS-2 (Lab ID: 60291978002)
- DS-3 (Lab ID: 60291978003)
- DS-4 (Lab ID: 60291978004)
- DS-5 (Lab ID: 60291978005)
- DS-6 (Lab ID: 60291978006)

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 564877

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291978001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2317700)

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: **EPA 8270**

Description: 8270 MSSV Semivolatiles

Client: EA Engineering, Science, and Technology

Date: January 22, 2019

QC Batch: 564877

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291978001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- 2,4-Dinitrophenol
- 3&4-Methylphenol(m&p Cresol)
- 3,3'-Dichlorobenzidine
- 4,6-Dinitro-2-methylphenol
- 4-Chloro-3-methylphenol
- 4-Nitrophenol
- Hexachlorocyclopentadiene
- Hexachloroethane
- MSD (Lab ID: 2317701)
 - 2,4-Dinitrophenol
 - 3&4-Methylphenol(m&p Cresol)
 - 3,3'-Dichlorobenzidine
 - 4,6-Dinitro-2-methylphenol
 - 4-Chloro-3-methylphenol
 - 4-Nitrophenol
 - Hexachlorocyclopentadiene
 - Hexachloroethane
 - N-Nitroso-di-n-propylamine
 - Phenol

Additional Comments:

Analyte Comments:

QC Batch: 564877

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- BLANK (Lab ID: 2317698)
 - Carbazole
- DS-1 (Lab ID: 60291978001)
 - Carbazole
- DS-2 (Lab ID: 60291978002)
 - Carbazole
- DS-3 (Lab ID: 60291978003)
 - Carbazole
- DS-4 (Lab ID: 60291978004)
 - Carbazole
- DS-5 (Lab ID: 60291978005)
 - Carbazole
- DS-6 (Lab ID: 60291978006)
 - Carbazole
- LCS (Lab ID: 2317699)
 - Carbazole

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: **EPA 8270**

Description: 8270 MSSV Semivolatiles

Client: EA Engineering, Science, and Technology

Date: January 22, 2019

Analyte Comments:

QC Batch: 564877

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- MS (Lab ID: 2317700)
 - Carbazole
- MSD (Lab ID: 2317701)
 - Carbazole

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: **EPA 8260**

Description: 8260 MSV 5035A VOA

Client: EA Engineering, Science, and Technology

Date: January 22, 2019

General Information:

6 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 565289

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2319415)
- Vinyl chloride

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 565289

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291962013

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2319416)
- Vinyl chloride

R1: RPD value was outside control limits.

- MSD (Lab ID: 2319417)
 - 1,2,3-Trichlorobenzene
 - 1,2,4-Trichlorobenzene
 - 1,2-Dichlorobenzene

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PROJECT NARRATIVE

Project: Big Ox Energy
Pace Project No.: 60291978

Method: **EPA 8260**

Description: 8260 MSV 5035A VOA

Client: EA Engineering, Science, and Technology

Date: January 22, 2019

QC Batch: 565289

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291962013

R1: RPD value was outside control limits.

- 1,3,5-Trimethylbenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Hexachloro-1,3-butadiene
- Naphthalene
- n-Butylbenzene
- p-Isopropyltoluene
- sec-Butylbenzene

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-1 Lab ID: 60291978001 Collected: 01/11/19 11:45 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	4.0	1.8	1	01/16/19 09:57	01/17/19 13:07	7440-38-2	
Barium	63.4	mg/kg	2.0	0.28	1	01/16/19 09:57	01/17/19 13:07	7440-39-3	
Cadmium	ND	mg/kg	2.0	0.27	1	01/16/19 09:57	01/17/19 13:07	7440-43-9	
Chromium	137	mg/kg	2.0	0.58	1	01/16/19 09:57	01/17/19 13:07	7440-47-3	
Lead	3.1	mg/kg	2.0	1.6	1	01/16/19 09:57	01/17/19 13:07	7439-92-1	
Selenium	2.3J	mg/kg	6.0	2.2	1	01/16/19 09:57	01/17/19 13:07	7782-49-2	
Silver	ND	mg/kg	2.8	0.55	1	01/16/19 09:57	01/17/19 13:07	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.16	0.062	1	01/16/19 12:20	01/17/19 10:52	7439-97-6	M1,R1
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7890	837	1	01/16/19 08:53	01/17/19 22:01	83-32-9	
Acenaphthylene	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	208-96-8	
Anthracene	ND	ug/kg	7890	837	1	01/16/19 08:53	01/17/19 22:01	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7890	550	1	01/16/19 08:53	01/17/19 22:01	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7890	765	1	01/16/19 08:53	01/17/19 22:01	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7890	933	1	01/16/19 08:53	01/17/19 22:01	207-08-9	
Benzoic acid	ND	ug/kg	39900	741	1	01/16/19 08:53	01/17/19 22:01	65-85-0	
Benzyl alcohol	ND	ug/kg	15800	2460	1	01/16/19 08:53	01/17/19 22:01	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	101-55-3	
Butylbenzylphthalate	ND	ug/kg	7890	1030	1	01/16/19 08:53	01/17/19 22:01	85-68-7	
Carbazole	ND	ug/kg	7890	646	1	01/16/19 08:53	01/17/19 22:01	86-74-8	N2
4-Chloro-3-methylphenol	ND	ug/kg	15800	861	1	01/16/19 08:53	01/17/19 22:01	59-50-7	M1
4-Chloroaniline	ND	ug/kg	15800	1550	1	01/16/19 08:53	01/17/19 22:01	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	7890	670	1	01/16/19 08:53	01/17/19 22:01	91-58-7	
2-Chlorophenol	ND	ug/kg	7890	646	1	01/16/19 08:53	01/17/19 22:01	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	7890	765	1	01/16/19 08:53	01/17/19 22:01	7005-72-3	
Chrysene	ND	ug/kg	7890	670	1	01/16/19 08:53	01/17/19 22:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	53-70-3	
Dibenzofuran	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	7890	598	1	01/16/19 08:53	01/17/19 22:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7890	670	1	01/16/19 08:53	01/17/19 22:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7890	694	1	01/16/19 08:53	01/17/19 22:01	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	15800	2700	1	01/16/19 08:53	01/17/19 22:01	91-94-1	M1
2,4-Dichlorophenol	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	120-83-2	
Diethylphthalate	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	7890	430	1	01/16/19 08:53	01/17/19 22:01	105-67-9	
Dimethylphthalate	ND	ug/kg	7890	765	1	01/16/19 08:53	01/17/19 22:01	131-11-3	
Di-n-butylphthalate	ND	ug/kg	7890	837	1	01/16/19 08:53	01/17/19 22:01	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-1 Lab ID: 60291978001 Collected: 01/11/19 11:45 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	39900	1050	1	01/16/19 08:53	01/17/19 22:01	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	39900	1150	1	01/16/19 08:53	01/17/19 22:01	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	7890	670	1	01/16/19 08:53	01/17/19 22:01	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	7890	813	1	01/16/19 08:53	01/17/19 22:01	606-20-2	
Di-n-octylphthalate	ND	ug/kg	7890	933	1	01/16/19 08:53	01/17/19 22:01	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	7890	2730	1	01/16/19 08:53	01/17/19 22:01	117-81-7	
Fluoranthene	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	206-44-0	
Fluorene	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	7890	789	1	01/16/19 08:53	01/17/19 22:01	87-68-3	
Hexachlorobenzene	ND	ug/kg	7890	765	1	01/16/19 08:53	01/17/19 22:01	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	7890	1670	1	01/16/19 08:53	01/17/19 22:01	77-47-4	M1
Hexachloroethane	ND	ug/kg	7890	598	1	01/16/19 08:53	01/17/19 22:01	67-72-1	M1
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7890	861	1	01/16/19 08:53	01/17/19 22:01	193-39-5	
Isophorone	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	78-59-1	
2-Methylnaphthalene	ND	ug/kg	7890	574	1	01/16/19 08:53	01/17/19 22:01	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	95-48-7	
3&4-Methylphenol(m&p Cresol)	40600	ug/kg	7890	861	1	01/16/19 08:53	01/17/19 22:01		M1
Naphthalene	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	91-20-3	
2-Nitroaniline	ND	ug/kg	15800	1340	1	01/16/19 08:53	01/17/19 22:01	88-74-4	
3-Nitroaniline	ND	ug/kg	15800	2390	1	01/16/19 08:53	01/17/19 22:01	99-09-2	
4-Nitroaniline	ND	ug/kg	15800	2030	1	01/16/19 08:53	01/17/19 22:01	100-01-6	
Nitrobenzene	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	98-95-3	
2-Nitrophenol	ND	ug/kg	7890	1100	1	01/16/19 08:53	01/17/19 22:01	88-75-5	
4-Nitrophenol	ND	ug/kg	39900	1240	1	01/16/19 08:53	01/17/19 22:01	100-02-7	M1
N-Nitroso-di-n-propylamine	ND	ug/kg	7890	789	1	01/16/19 08:53	01/17/19 22:01	621-64-7	M1
N-Nitrosodiphenylamine	ND	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	86-30-6	
Pentachlorophenol	ND	ug/kg	39900	741	1	01/16/19 08:53	01/17/19 22:01	87-86-5	
Phenanthrene	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	85-01-8	
Phenol	21000	ug/kg	7890	622	1	01/16/19 08:53	01/17/19 22:01	108-95-2	M1
Pyrene	ND	ug/kg	7890	789	1	01/16/19 08:53	01/17/19 22:01	129-00-0	
Pyridine	ND	ug/kg	7890	646	1	01/16/19 08:53	01/17/19 22:01	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	7890	717	1	01/16/19 08:53	01/17/19 22:01	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	7890	741	1	01/16/19 08:53	01/17/19 22:01	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	78	%	35-119		1	01/16/19 08:53	01/17/19 22:01	4165-60-0	P3
2-Fluorobiphenyl (S)	70	%	55-110		1	01/16/19 08:53	01/17/19 22:01	321-60-8	
Terphenyl-d14 (S)	91	%	45-114		1	01/16/19 08:53	01/17/19 22:01	1718-51-0	
Phenol-d6 (S)	79	%	48-110		1	01/16/19 08:53	01/17/19 22:01	13127-88-3	
2-Fluorophenol (S)	82	%	46-108		1	01/16/19 08:53	01/17/19 22:01	367-12-4	
2,4,6-Tribromophenol (S)	63	%	35-119		1	01/16/19 08:53	01/17/19 22:01	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	7130	ug/kg	95.7	77.5	1			01/18/19 15:59	67-64-1
Benzene	ND	ug/kg	23.9	2.4	1			01/18/19 15:59	71-43-2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-1 Lab ID: 60291978001 Collected: 01/11/19 11:45 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	23.9	4.5	1		01/18/19 15:59	108-86-1	
Bromochloromethane	ND	ug/kg	23.9	2.9	1		01/18/19 15:59	74-97-5	
Bromodichloromethane	ND	ug/kg	23.9	2.9	1		01/18/19 15:59	75-27-4	
Bromoform	ND	ug/kg	23.9	2.8	1		01/18/19 15:59	75-25-2	
Bromomethane	ND	ug/kg	23.9	14.1	1		01/18/19 15:59	74-83-9	
2-Butanone (MEK)	129	ug/kg	47.8	16.3	1		01/18/19 15:59	78-93-3	
n-Butylbenzene	7.0J	ug/kg	23.9	3.1	1		01/18/19 15:59	104-51-8	
sec-Butylbenzene	5.1J	ug/kg	23.9	3.5	1		01/18/19 15:59	135-98-8	
tert-Butylbenzene	ND	ug/kg	23.9	4.2	1		01/18/19 15:59	98-06-6	
Carbon disulfide	25.7	ug/kg	23.9	3.1	1		01/18/19 15:59	75-15-0	
Carbon tetrachloride	ND	ug/kg	23.9	4.1	1		01/18/19 15:59	56-23-5	
Chlorobenzene	ND	ug/kg	23.9	3.0	1		01/18/19 15:59	108-90-7	
Chloroethane	ND	ug/kg	23.9	7.2	1		01/18/19 15:59	75-00-3	
Chloroform	ND	ug/kg	23.9	2.4	1		01/18/19 15:59	67-66-3	
Chloromethane	ND	ug/kg	23.9	3.8	1		01/18/19 15:59	74-87-3	
2-Chlorotoluene	ND	ug/kg	23.9	3.5	1		01/18/19 15:59	95-49-8	
4-Chlorotoluene	ND	ug/kg	23.9	2.9	1		01/18/19 15:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	47.8	8.8	1		01/18/19 15:59	96-12-8	
Dibromochloromethane	ND	ug/kg	23.9	3.1	1		01/18/19 15:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	23.9	2.6	1		01/18/19 15:59	106-93-4	
Dibromomethane	ND	ug/kg	23.9	2.9	1		01/18/19 15:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	23.9	3.0	1		01/18/19 15:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	23.9	3.4	1		01/18/19 15:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	23.9	3.9	1		01/18/19 15:59	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	23.9	5.6	1		01/18/19 15:59	75-71-8	
1,1-Dichloroethane	ND	ug/kg	23.9	1.9	1		01/18/19 15:59	75-34-3	
1,2-Dichloroethane	ND	ug/kg	23.9	1.9	1		01/18/19 15:59	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	23.9	5.3	1		01/18/19 15:59	540-59-0	
1,1-Dichloroethene	ND	ug/kg	23.9	3.1	1		01/18/19 15:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	23.9	2.1	1		01/18/19 15:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	23.9	3.2	1		01/18/19 15:59	156-60-5	
1,2-Dichloropropane	ND	ug/kg	23.9	4.7	1		01/18/19 15:59	78-87-5	
1,3-Dichloropropane	ND	ug/kg	23.9	3.3	1		01/18/19 15:59	142-28-9	
2,2-Dichloropropane	ND	ug/kg	23.9	2.3	1		01/18/19 15:59	594-20-7	
1,1-Dichloropropene	ND	ug/kg	23.9	4.3	1		01/18/19 15:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	23.9	2.5	1		01/18/19 15:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	23.9	2.2	1		01/18/19 15:59	10061-02-6	
Ethylbenzene	17.9J	ug/kg	23.9	2.2	1		01/18/19 15:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	23.9	4.1	1		01/18/19 15:59	87-68-3	
n-Hexane	ND	ug/kg	23.9	12.0	1		01/18/19 15:59	110-54-3	
2-Hexanone	ND	ug/kg	95.7	11.9	1		01/18/19 15:59	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/kg	23.9	2.7	1		01/18/19 15:59	98-82-8	
p-Isopropyltoluene	469	ug/kg	23.9	3.3	1		01/18/19 15:59	99-87-6	
Methylene chloride	16.0J	ug/kg	23.9	13.1	1		01/18/19 15:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	47.8	14.5	1		01/18/19 15:59	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-1 Lab ID: 60291978001 Collected: 01/11/19 11:45 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Methyl-tert-butyl ether	ND	ug/kg	23.9	2.3	1		01/18/19 15:59	1634-04-4	
Naphthalene	20.1J	ug/kg	47.8	3.9	1		01/18/19 15:59	91-20-3	
n-Propylbenzene	ND	ug/kg	23.9	3.8	1		01/18/19 15:59	103-65-1	
Styrene	ND	ug/kg	23.9	2.8	1		01/18/19 15:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	23.9	4.9	1		01/18/19 15:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	23.9	4.8	1		01/18/19 15:59	79-34-5	
Tetrachloroethene	ND	ug/kg	23.9	2.0	1		01/18/19 15:59	127-18-4	
Toluene	325	ug/kg	23.9	1.7	1		01/18/19 15:59	108-88-3	
1,2,3-Trichlorobenzene	102	ug/kg	23.9	3.8	1		01/18/19 15:59	87-61-6	
1,2,4-Trichlorobenzene	7.9J	ug/kg	23.9	3.8	1		01/18/19 15:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	23.9	3.6	1		01/18/19 15:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	23.9	3.0	1		01/18/19 15:59	79-00-5	
Trichloroethene	ND	ug/kg	23.9	3.5	1		01/18/19 15:59	79-01-6	
Trichlorofluoromethane	ND	ug/kg	23.9	2.9	1		01/18/19 15:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	23.9	10.2	1		01/18/19 15:59	96-18-4	
1,2,4-Trimethylbenzene	15.1J	ug/kg	23.9	3.2	1		01/18/19 15:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	23.9	3.0	1		01/18/19 15:59	108-67-8	
Vinyl chloride	ND	ug/kg	23.9	3.2	1		01/18/19 15:59	75-01-4	
Xylene (Total)	ND	ug/kg	23.9	5.5	1		01/18/19 15:59	1330-20-7	
Surrogates									
Toluene-d8 (S)	103	%	78-122		1		01/18/19 15:59	2037-26-5	
4-Bromofluorobenzene (S)	111	%	69-133		1		01/18/19 15:59	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	80-123		1		01/18/19 15:59	17060-07-0	
Percent Moisture									
Analytical Method: ASTM D2974									
Percent Moisture	79.3	%	0.50	0.50	1		01/16/19 14:15		L1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-2 Lab ID: 60291978002 Collected: 01/11/19 12:10 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	2.3J	mg/kg	2.6	1.2	1	01/16/19 09:57	01/17/19 13:09	7440-38-2	
Barium	78.7	mg/kg	1.3	0.19	1	01/16/19 09:57	01/17/19 13:09	7440-39-3	
Cadmium	ND	mg/kg	1.3	0.18	1	01/16/19 09:57	01/17/19 13:09	7440-43-9	
Chromium	94.1	mg/kg	1.3	0.38	1	01/16/19 09:57	01/17/19 13:09	7440-47-3	
Lead	3.6	mg/kg	1.3	1.0	1	01/16/19 09:57	01/17/19 13:09	7439-92-1	
Selenium	1.9J	mg/kg	4.0	1.5	1	01/16/19 09:57	01/17/19 13:09	7782-49-2	
Silver	ND	mg/kg	1.8	0.36	1	01/16/19 09:57	01/17/19 13:09	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.12	0.045	1	01/16/19 12:20	01/17/19 11:03	7439-97-6	
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	6280	666	1	01/16/19 08:53	01/17/19 22:22	83-32-9	
Acenaphthylene	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	208-96-8	
Anthracene	ND	ug/kg	6280	666	1	01/16/19 08:53	01/17/19 22:22	120-12-7	
Benzo(a)anthracene	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	56-55-3	
Benzo(a)pyrene	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	6280	438	1	01/16/19 08:53	01/17/19 22:22	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	6280	609	1	01/16/19 08:53	01/17/19 22:22	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	6280	742	1	01/16/19 08:53	01/17/19 22:22	207-08-9	
Benzoic acid	ND	ug/kg	31800	590	1	01/16/19 08:53	01/17/19 22:22	65-85-0	
Benzyl alcohol	ND	ug/kg	12600	1960	1	01/16/19 08:53	01/17/19 22:22	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	101-55-3	
Butylbenzylphthalate	ND	ug/kg	6280	818	1	01/16/19 08:53	01/17/19 22:22	85-68-7	
Carbazole	ND	ug/kg	6280	514	1	01/16/19 08:53	01/17/19 22:22	86-74-8	N2
4-Chloro-3-methylphenol	26500	ug/kg	12600	685	1	01/16/19 08:53	01/17/19 22:22	59-50-7	
4-Chloroaniline	ND	ug/kg	12600	1240	1	01/16/19 08:53	01/17/19 22:22	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	6280	533	1	01/16/19 08:53	01/17/19 22:22	91-58-7	
2-Chlorophenol	ND	ug/kg	6280	514	1	01/16/19 08:53	01/17/19 22:22	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	6280	609	1	01/16/19 08:53	01/17/19 22:22	7005-72-3	
Chrysene	ND	ug/kg	6280	533	1	01/16/19 08:53	01/17/19 22:22	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	53-70-3	
Dibenzofuran	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	6280	476	1	01/16/19 08:53	01/17/19 22:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6280	533	1	01/16/19 08:53	01/17/19 22:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6280	552	1	01/16/19 08:53	01/17/19 22:22	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	12600	2150	1	01/16/19 08:53	01/17/19 22:22	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	120-83-2	
Diethylphthalate	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	6280	343	1	01/16/19 08:53	01/17/19 22:22	105-67-9	
Dimethylphthalate	ND	ug/kg	6280	609	1	01/16/19 08:53	01/17/19 22:22	131-11-3	
Di-n-butylphthalate	ND	ug/kg	6280	666	1	01/16/19 08:53	01/17/19 22:22	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-2 Lab ID: 60291978002 Collected: 01/11/19 12:10 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	31800	837	1	01/16/19 08:53	01/17/19 22:22	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	31800	913	1	01/16/19 08:53	01/17/19 22:22	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	6280	533	1	01/16/19 08:53	01/17/19 22:22	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	6280	647	1	01/16/19 08:53	01/17/19 22:22	606-20-2	
Di-n-octylphthalate	ND	ug/kg	6280	742	1	01/16/19 08:53	01/17/19 22:22	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	6280	2170	1	01/16/19 08:53	01/17/19 22:22	117-81-7	
Fluoranthene	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	206-44-0	
Fluorene	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	6280	628	1	01/16/19 08:53	01/17/19 22:22	87-68-3	
Hexachlorobenzene	ND	ug/kg	6280	609	1	01/16/19 08:53	01/17/19 22:22	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	6280	1330	1	01/16/19 08:53	01/17/19 22:22	77-47-4	
Hexachloroethane	ND	ug/kg	6280	476	1	01/16/19 08:53	01/17/19 22:22	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	6280	685	1	01/16/19 08:53	01/17/19 22:22	193-39-5	
Isophorone	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	78-59-1	
2-Methylnaphthalene	ND	ug/kg	6280	457	1	01/16/19 08:53	01/17/19 22:22	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	95-48-7	
3&4-Methylphenol(m&p Cresol)	47500	ug/kg	6280	685	1	01/16/19 08:53	01/17/19 22:22		
Naphthalene	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	91-20-3	
2-Nitroaniline	ND	ug/kg	12600	1070	1	01/16/19 08:53	01/17/19 22:22	88-74-4	
3-Nitroaniline	ND	ug/kg	12600	1900	1	01/16/19 08:53	01/17/19 22:22	99-09-2	
4-Nitroaniline	ND	ug/kg	12600	1620	1	01/16/19 08:53	01/17/19 22:22	100-01-6	
Nitrobenzene	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	98-95-3	
2-Nitrophenol	ND	ug/kg	6280	875	1	01/16/19 08:53	01/17/19 22:22	88-75-5	
4-Nitrophenol	ND	ug/kg	31800	990	1	01/16/19 08:53	01/17/19 22:22	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	6280	628	1	01/16/19 08:53	01/17/19 22:22	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	86-30-6	
Pentachlorophenol	ND	ug/kg	31800	590	1	01/16/19 08:53	01/17/19 22:22	87-86-5	
Phenanthrene	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	85-01-8	
Phenol	22100	ug/kg	6280	495	1	01/16/19 08:53	01/17/19 22:22	108-95-2	
Pyrene	ND	ug/kg	6280	628	1	01/16/19 08:53	01/17/19 22:22	129-00-0	
Pyridine	ND	ug/kg	6280	514	1	01/16/19 08:53	01/17/19 22:22	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	6280	571	1	01/16/19 08:53	01/17/19 22:22	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	6280	590	1	01/16/19 08:53	01/17/19 22:22	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	76	%	35-119		1	01/16/19 08:53	01/17/19 22:22	4165-60-0	P3
2-Fluorobiphenyl (S)	70	%	55-110		1	01/16/19 08:53	01/17/19 22:22	321-60-8	
Terphenyl-d14 (S)	88	%	45-114		1	01/16/19 08:53	01/17/19 22:22	1718-51-0	
Phenol-d6 (S)	80	%	48-110		1	01/16/19 08:53	01/17/19 22:22	13127-88-3	
2-Fluorophenol (S)	85	%	46-108		1	01/16/19 08:53	01/17/19 22:22	367-12-4	
2,4,6-Tribromophenol (S)	63	%	35-119		1	01/16/19 08:53	01/17/19 22:22	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	2860	ug/kg	77.7	63.0	1		01/18/19 16:15	67-64-1	
Benzene	ND	ug/kg	19.4	1.9	1		01/18/19 16:15	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-2 Lab ID: 60291978002 Collected: 01/11/19 12:10 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	19.4	3.6	1		01/18/19 16:15	108-86-1	
Bromoform	ND	ug/kg	19.4	2.3	1		01/18/19 16:15	74-97-5	
Bromochloromethane	ND	ug/kg	19.4	2.3	1		01/18/19 16:15	75-27-4	
Bromodichloromethane	ND	ug/kg	19.4	2.2	1		01/18/19 16:15	75-25-2	
Bromomethane	ND	ug/kg	19.4	11.4	1		01/18/19 16:15	74-83-9	
2-Butanone (MEK)	571	ug/kg	38.9	13.3	1		01/18/19 16:15	78-93-3	
n-Butylbenzene	4.8J	ug/kg	19.4	2.5	1		01/18/19 16:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	19.4	2.8	1		01/18/19 16:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	19.4	3.4	1		01/18/19 16:15	98-06-6	
Carbon disulfide	14.7J	ug/kg	19.4	2.5	1		01/18/19 16:15	75-15-0	
Carbon tetrachloride	ND	ug/kg	19.4	3.3	1		01/18/19 16:15	56-23-5	
Chlorobenzene	ND	ug/kg	19.4	2.4	1		01/18/19 16:15	108-90-7	
Chloroethane	ND	ug/kg	19.4	5.8	1		01/18/19 16:15	75-00-3	
Chloroform	ND	ug/kg	19.4	1.9	1		01/18/19 16:15	67-66-3	
Chloromethane	ND	ug/kg	19.4	3.1	1		01/18/19 16:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	19.4	2.8	1		01/18/19 16:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	19.4	2.3	1		01/18/19 16:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	38.9	7.1	1		01/18/19 16:15	96-12-8	
Dibromochloromethane	ND	ug/kg	19.4	2.5	1		01/18/19 16:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	19.4	2.1	1		01/18/19 16:15	106-93-4	
Dibromomethane	ND	ug/kg	19.4	2.3	1		01/18/19 16:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	19.4	2.4	1		01/18/19 16:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	19.4	2.8	1		01/18/19 16:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	19.4	3.1	1		01/18/19 16:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	19.4	4.6	1		01/18/19 16:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	19.4	1.5	1		01/18/19 16:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	19.4	1.6	1		01/18/19 16:15	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	19.4	4.3	1		01/18/19 16:15	540-59-0	
1,1-Dichloroethene	ND	ug/kg	19.4	2.5	1		01/18/19 16:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	19.4	1.7	1		01/18/19 16:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	19.4	2.6	1		01/18/19 16:15	156-60-5	
1,2-Dichloropropane	ND	ug/kg	19.4	3.8	1		01/18/19 16:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	19.4	2.7	1		01/18/19 16:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	19.4	1.8	1		01/18/19 16:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	19.4	3.5	1		01/18/19 16:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	19.4	2.1	1		01/18/19 16:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	19.4	1.8	1		01/18/19 16:15	10061-02-6	
Ethylbenzene	ND	ug/kg	19.4	1.8	1		01/18/19 16:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	19.4	3.3	1		01/18/19 16:15	87-68-3	
n-Hexane	ND	ug/kg	19.4	9.7	1		01/18/19 16:15	110-54-3	
2-Hexanone	ND	ug/kg	77.7	9.7	1		01/18/19 16:15	591-78-6	
Isopropylbenzene (Cumene)	8.7J	ug/kg	19.4	2.2	1		01/18/19 16:15	98-82-8	
p-Isopropyltoluene	126	ug/kg	19.4	2.7	1		01/18/19 16:15	99-87-6	
Methylene chloride	ND	ug/kg	19.4	10.6	1		01/18/19 16:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	38.9	11.8	1		01/18/19 16:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-2 Lab ID: 60291978002 Collected: 01/11/19 12:10 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit			Prepared	Analyzed	CAS No.	Qual
			MDL	DF					
8260 MSV 5035A VOA	Analytical Method: EPA 8260								
Methyl-tert-butyl ether	ND	ug/kg	19.4	1.9	1		01/18/19 16:15	1634-04-4	
Naphthalene	ND	ug/kg	38.9	3.2	1		01/18/19 16:15	91-20-3	
n-Propylbenzene	ND	ug/kg	19.4	3.1	1		01/18/19 16:15	103-65-1	
Styrene	ND	ug/kg	19.4	2.3	1		01/18/19 16:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	19.4	4.0	1		01/18/19 16:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	19.4	3.9	1		01/18/19 16:15	79-34-5	
Tetrachloroethene	ND	ug/kg	19.4	1.6	1		01/18/19 16:15	127-18-4	
Toluene	681	ug/kg	19.4	1.4	1		01/18/19 16:15	108-88-3	
1,2,3-Trichlorobenzene	23.9	ug/kg	19.4	3.1	1		01/18/19 16:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	19.4	3.1	1		01/18/19 16:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	19.4	2.9	1		01/18/19 16:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	19.4	2.4	1		01/18/19 16:15	79-00-5	
Trichloroethene	ND	ug/kg	19.4	2.8	1		01/18/19 16:15	79-01-6	
Trichlorofluoromethane	ND	ug/kg	19.4	2.4	1		01/18/19 16:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	19.4	8.3	1		01/18/19 16:15	96-18-4	
1,2,4-Trimethylbenzene	4.4J	ug/kg	19.4	2.6	1		01/18/19 16:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	19.4	2.4	1		01/18/19 16:15	108-67-8	
Vinyl chloride	ND	ug/kg	19.4	2.6	1		01/18/19 16:15	75-01-4	
Xylene (Total)	ND	ug/kg	19.4	4.4	1		01/18/19 16:15	1330-20-7	
Surrogates									
Toluene-d8 (S)	103	%	78-122		1		01/18/19 16:15	2037-26-5	
4-Bromofluorobenzene (S)	113	%	69-133		1		01/18/19 16:15	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	80-123		1		01/18/19 16:15	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974								
Percent Moisture	74.0	%	0.50	0.50	1		01/16/19 14:15		L1

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-3 Lab ID: 60291978003 Collected: 01/11/19 12:35 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	2.4J	mg/kg	4.4	1.9	1	01/16/19 09:57	01/17/19 13:11	7440-38-2	
Barium	65.2	mg/kg	2.2	0.31	1	01/16/19 09:57	01/17/19 13:11	7440-39-3	
Cadmium	ND	mg/kg	2.2	0.30	1	01/16/19 09:57	01/17/19 13:11	7440-43-9	
Chromium	138	mg/kg	2.2	0.64	1	01/16/19 09:57	01/17/19 13:11	7440-47-3	
Lead	2.4	mg/kg	2.2	1.7	1	01/16/19 09:57	01/17/19 13:11	7439-92-1	
Selenium	ND	mg/kg	6.6	2.5	1	01/16/19 09:57	01/17/19 13:11	7782-49-2	
Silver	ND	mg/kg	3.1	0.60	1	01/16/19 09:57	01/17/19 13:11	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.16	0.060	1	01/16/19 12:20	01/17/19 11:06	7439-97-6	
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7920	840	1	01/16/19 08:53	01/17/19 22:44	83-32-9	
Acenaphthylene	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	208-96-8	
Anthracene	ND	ug/kg	7920	840	1	01/16/19 08:53	01/17/19 22:44	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7920	552	1	01/16/19 08:53	01/17/19 22:44	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7920	768	1	01/16/19 08:53	01/17/19 22:44	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7920	936	1	01/16/19 08:53	01/17/19 22:44	207-08-9	
Benzoic acid	ND	ug/kg	40100	744	1	01/16/19 08:53	01/17/19 22:44	65-85-0	
Benzyl alcohol	ND	ug/kg	15800	2470	1	01/16/19 08:53	01/17/19 22:44	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	101-55-3	
Butylbenzylphthalate	ND	ug/kg	7920	1030	1	01/16/19 08:53	01/17/19 22:44	85-68-7	
Carbazole	ND	ug/kg	7920	648	1	01/16/19 08:53	01/17/19 22:44	86-74-8	N2
4-Chloro-3-methylphenol	ND	ug/kg	15800	864	1	01/16/19 08:53	01/17/19 22:44	59-50-7	
4-Chloroaniline	ND	ug/kg	15800	1560	1	01/16/19 08:53	01/17/19 22:44	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	7920	672	1	01/16/19 08:53	01/17/19 22:44	91-58-7	
2-Chlorophenol	ND	ug/kg	7920	648	1	01/16/19 08:53	01/17/19 22:44	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	7920	768	1	01/16/19 08:53	01/17/19 22:44	7005-72-3	
Chrysene	ND	ug/kg	7920	672	1	01/16/19 08:53	01/17/19 22:44	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	53-70-3	
Dibenzofuran	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	7920	600	1	01/16/19 08:53	01/17/19 22:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7920	672	1	01/16/19 08:53	01/17/19 22:44	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7920	696	1	01/16/19 08:53	01/17/19 22:44	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	15800	2710	1	01/16/19 08:53	01/17/19 22:44	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	120-83-2	
Diethylphthalate	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	7920	432	1	01/16/19 08:53	01/17/19 22:44	105-67-9	
Dimethylphthalate	ND	ug/kg	7920	768	1	01/16/19 08:53	01/17/19 22:44	131-11-3	
Di-n-butylphthalate	ND	ug/kg	7920	840	1	01/16/19 08:53	01/17/19 22:44	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-3 Lab ID: 60291978003 Collected: 01/11/19 12:35 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	40100	1060	1	01/16/19 08:53	01/17/19 22:44	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	40100	1150	1	01/16/19 08:53	01/17/19 22:44	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	7920	672	1	01/16/19 08:53	01/17/19 22:44	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	7920	816	1	01/16/19 08:53	01/17/19 22:44	606-20-2	
Di-n-octylphthalate	ND	ug/kg	7920	936	1	01/16/19 08:53	01/17/19 22:44	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	7920	2740	1	01/16/19 08:53	01/17/19 22:44	117-81-7	
Fluoranthene	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	206-44-0	
Fluorene	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	7920	792	1	01/16/19 08:53	01/17/19 22:44	87-68-3	
Hexachlorobenzene	ND	ug/kg	7920	768	1	01/16/19 08:53	01/17/19 22:44	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	7920	1680	1	01/16/19 08:53	01/17/19 22:44	77-47-4	
Hexachloroethane	ND	ug/kg	7920	600	1	01/16/19 08:53	01/17/19 22:44	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7920	864	1	01/16/19 08:53	01/17/19 22:44	193-39-5	
Isophorone	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	78-59-1	
2-Methylnaphthalene	ND	ug/kg	7920	576	1	01/16/19 08:53	01/17/19 22:44	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	95-48-7	
3&4-Methylphenol(m&p Cresol)	109000	ug/kg	39600	4320	5	01/16/19 08:53	01/22/19 02:47		
Naphthalene	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	91-20-3	
2-Nitroaniline	ND	ug/kg	15800	1340	1	01/16/19 08:53	01/17/19 22:44	88-74-4	
3-Nitroaniline	ND	ug/kg	15800	2400	1	01/16/19 08:53	01/17/19 22:44	99-09-2	
4-Nitroaniline	ND	ug/kg	15800	2040	1	01/16/19 08:53	01/17/19 22:44	100-01-6	
Nitrobenzene	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	98-95-3	
2-Nitrophenol	ND	ug/kg	7920	1100	1	01/16/19 08:53	01/17/19 22:44	88-75-5	
4-Nitrophenol	ND	ug/kg	40100	1250	1	01/16/19 08:53	01/17/19 22:44	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	7920	792	1	01/16/19 08:53	01/17/19 22:44	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	86-30-6	
Pentachlorophenol	ND	ug/kg	40100	744	1	01/16/19 08:53	01/17/19 22:44	87-86-5	
Phenanthrene	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	85-01-8	
Phenol	25600	ug/kg	7920	624	1	01/16/19 08:53	01/17/19 22:44	108-95-2	
Pyrene	ND	ug/kg	7920	792	1	01/16/19 08:53	01/17/19 22:44	129-00-0	
Pyridine	ND	ug/kg	7920	648	1	01/16/19 08:53	01/17/19 22:44	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	7920	720	1	01/16/19 08:53	01/17/19 22:44	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	7920	744	1	01/16/19 08:53	01/17/19 22:44	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	74	%	35-119		1	01/16/19 08:53	01/17/19 22:44	4165-60-0	P3
2-Fluorobiphenyl (S)	66	%	55-110		1	01/16/19 08:53	01/17/19 22:44	321-60-8	
Terphenyl-d14 (S)	84	%	45-114		1	01/16/19 08:53	01/17/19 22:44	1718-51-0	
Phenol-d6 (S)	74	%	48-110		1	01/16/19 08:53	01/17/19 22:44	13127-88-3	
2-Fluorophenol (S)	79	%	46-108		1	01/16/19 08:53	01/17/19 22:44	367-12-4	
2,4,6-Tribromophenol (S)	58	%	35-119		1	01/16/19 08:53	01/17/19 22:44	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	5260	ug/kg	97.9	79.3	1		01/18/19 16:31	67-64-1	
Benzene	ND	ug/kg	24.5	2.4	1		01/18/19 16:31	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-3 Lab ID: 60291978003 Collected: 01/11/19 12:35 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	24.5	4.6	1		01/18/19 16:31	108-86-1	
Bromochloromethane	ND	ug/kg	24.5	2.9	1		01/18/19 16:31	74-97-5	
Bromodichloromethane	ND	ug/kg	24.5	2.9	1		01/18/19 16:31	75-27-4	
Bromoform	ND	ug/kg	24.5	2.8	1		01/18/19 16:31	75-25-2	
Bromomethane	ND	ug/kg	24.5	14.4	1		01/18/19 16:31	74-83-9	
2-Butanone (MEK)	1290	ug/kg	49.0	16.7	1		01/18/19 16:31	78-93-3	
n-Butylbenzene	9.5J	ug/kg	24.5	3.2	1		01/18/19 16:31	104-51-8	
sec-Butylbenzene	4.9J	ug/kg	24.5	3.6	1		01/18/19 16:31	135-98-8	
tert-Butylbenzene	ND	ug/kg	24.5	4.3	1		01/18/19 16:31	98-06-6	
Carbon disulfide	32.9	ug/kg	24.5	3.1	1		01/18/19 16:31	75-15-0	
Carbon tetrachloride	ND	ug/kg	24.5	4.2	1		01/18/19 16:31	56-23-5	
Chlorobenzene	ND	ug/kg	24.5	3.1	1		01/18/19 16:31	108-90-7	
Chloroethane	ND	ug/kg	24.5	7.3	1		01/18/19 16:31	75-00-3	
Chloroform	ND	ug/kg	24.5	2.4	1		01/18/19 16:31	67-66-3	
Chloromethane	ND	ug/kg	24.5	3.9	1		01/18/19 16:31	74-87-3	
2-Chlorotoluene	ND	ug/kg	24.5	3.6	1		01/18/19 16:31	95-49-8	
4-Chlorotoluene	ND	ug/kg	24.5	2.9	1		01/18/19 16:31	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	49.0	9.0	1		01/18/19 16:31	96-12-8	
Dibromochloromethane	ND	ug/kg	24.5	3.2	1		01/18/19 16:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	24.5	2.6	1		01/18/19 16:31	106-93-4	
Dibromomethane	ND	ug/kg	24.5	2.9	1		01/18/19 16:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	24.5	3.1	1		01/18/19 16:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	24.5	3.5	1		01/18/19 16:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	24.5	4.0	1		01/18/19 16:31	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	24.5	5.8	1		01/18/19 16:31	75-71-8	
1,1-Dichloroethane	ND	ug/kg	24.5	1.9	1		01/18/19 16:31	75-34-3	
1,2-Dichloroethane	ND	ug/kg	24.5	2.0	1		01/18/19 16:31	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	24.5	5.4	1		01/18/19 16:31	540-59-0	
1,1-Dichloroethene	ND	ug/kg	24.5	3.1	1		01/18/19 16:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	24.5	2.1	1		01/18/19 16:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	24.5	3.3	1		01/18/19 16:31	156-60-5	
1,2-Dichloropropane	ND	ug/kg	24.5	4.8	1		01/18/19 16:31	78-87-5	
1,3-Dichloropropane	ND	ug/kg	24.5	3.4	1		01/18/19 16:31	142-28-9	
2,2-Dichloropropane	ND	ug/kg	24.5	2.3	1		01/18/19 16:31	594-20-7	
1,1-Dichloropropene	ND	ug/kg	24.5	4.4	1		01/18/19 16:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	24.5	2.6	1		01/18/19 16:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	24.5	2.2	1		01/18/19 16:31	10061-02-6	
Ethylbenzene	ND	ug/kg	24.5	2.3	1		01/18/19 16:31	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	24.5	4.2	1		01/18/19 16:31	87-68-3	
n-Hexane	ND	ug/kg	24.5	12.2	1		01/18/19 16:31	110-54-3	
2-Hexanone	ND	ug/kg	97.9	12.2	1		01/18/19 16:31	591-78-6	
Isopropylbenzene (Cumene)	76.5	ug/kg	24.5	2.8	1		01/18/19 16:31	98-82-8	
p-Isopropyltoluene	986	ug/kg	24.5	3.4	1		01/18/19 16:31	99-87-6	
Methylene chloride	ND	ug/kg	24.5	13.4	1		01/18/19 16:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	49.0	14.8	1		01/18/19 16:31	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-3 Lab ID: 60291978003 Collected: 01/11/19 12:35 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report	MDL	DF	Prepared	Analyzed	CAS No.	Qual
			Limit						
8260 MSV 5035A VOA Analytical Method: EPA 8260									
Methyl-tert-butyl ether	ND	ug/kg	24.5	2.4	1		01/18/19 16:31	1634-04-4	
Naphthalene	24.4J	ug/kg	49.0	4.0	1		01/18/19 16:31	91-20-3	
n-Propylbenzene	ND	ug/kg	24.5	3.9	1		01/18/19 16:31	103-65-1	
Styrene	ND	ug/kg	24.5	2.9	1		01/18/19 16:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	24.5	5.0	1		01/18/19 16:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	24.5	4.9	1		01/18/19 16:31	79-34-5	
Tetrachloroethene	ND	ug/kg	24.5	2.0	1		01/18/19 16:31	127-18-4	
Toluene	10800	ug/kg	1210	85.3	50		01/21/19 16:30	108-88-3	
1,2,3-Trichlorobenzene	132	ug/kg	24.5	3.9	1		01/18/19 16:31	87-61-6	
1,2,4-Trichlorobenzene	8.2J	ug/kg	24.5	3.9	1		01/18/19 16:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	24.5	3.7	1		01/18/19 16:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	24.5	3.1	1		01/18/19 16:31	79-00-5	
Trichloroethene	ND	ug/kg	24.5	3.5	1		01/18/19 16:31	79-01-6	
Trichlorofluoromethane	ND	ug/kg	24.5	3.0	1		01/18/19 16:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	24.5	10.5	1		01/18/19 16:31	96-18-4	
1,2,4-Trimethylbenzene	19.0J	ug/kg	24.5	3.3	1		01/18/19 16:31	95-63-6	
1,3,5-Trimethylbenzene	4.9J	ug/kg	24.5	3.1	1		01/18/19 16:31	108-67-8	
Vinyl chloride	ND	ug/kg	24.5	3.3	1		01/18/19 16:31	75-01-4	L1
Xylene (Total)	ND	ug/kg	24.5	5.6	1		01/18/19 16:31	1330-20-7	
Surrogates									
Toluene-d8 (S)	104	%	78-122		1		01/18/19 16:31	2037-26-5	
4-Bromofluorobenzene (S)	120	%	69-133		1		01/18/19 16:31	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	80-123		1		01/18/19 16:31	17060-07-0	
Percent Moisture Analytical Method: ASTM D2974									
Percent Moisture	79.5	%	0.50	0.50	1		01/16/19 14:15		

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-4 Lab ID: 60291978004 Collected: 01/11/19 12:50 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	4.1	1.8	1	01/16/19 09:57	01/17/19 13:20	7440-38-2	
Barium	66.1	mg/kg	2.1	0.29	1	01/16/19 09:57	01/17/19 13:20	7440-39-3	
Cadmium	0.39J	mg/kg	2.1	0.28	1	01/16/19 09:57	01/17/19 13:20	7440-43-9	
Chromium	144	mg/kg	2.1	0.59	1	01/16/19 09:57	01/17/19 13:20	7440-47-3	
Lead	3.1	mg/kg	2.1	1.6	1	01/16/19 09:57	01/17/19 13:20	7439-92-1	
Selenium	ND	mg/kg	6.2	2.3	1	01/16/19 09:57	01/17/19 13:20	7782-49-2	
Silver	ND	mg/kg	2.9	0.56	1	01/16/19 09:57	01/17/19 13:20	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.15	0.055	1	01/16/19 12:20	01/17/19 11:08	7439-97-6	
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7550	801	1	01/16/19 08:53	01/17/19 23:06	83-32-9	
Acenaphthylene	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	208-96-8	
Anthracene	ND	ug/kg	7550	801	1	01/16/19 08:53	01/17/19 23:06	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7550	526	1	01/16/19 08:53	01/17/19 23:06	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7550	733	1	01/16/19 08:53	01/17/19 23:06	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7550	893	1	01/16/19 08:53	01/17/19 23:06	207-08-9	
Benzoic acid	ND	ug/kg	38200	710	1	01/16/19 08:53	01/17/19 23:06	65-85-0	
Benzyl alcohol	ND	ug/kg	15100	2360	1	01/16/19 08:53	01/17/19 23:06	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	101-55-3	
Butylbenzylphthalate	ND	ug/kg	7550	984	1	01/16/19 08:53	01/17/19 23:06	85-68-7	
Carbazole	ND	ug/kg	7550	618	1	01/16/19 08:53	01/17/19 23:06	86-74-8	N2
4-Chloro-3-methylphenol	ND	ug/kg	15100	824	1	01/16/19 08:53	01/17/19 23:06	59-50-7	
4-Chloroaniline	ND	ug/kg	15100	1490	1	01/16/19 08:53	01/17/19 23:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	7550	641	1	01/16/19 08:53	01/17/19 23:06	91-58-7	
2-Chlorophenol	ND	ug/kg	7550	618	1	01/16/19 08:53	01/17/19 23:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	7550	733	1	01/16/19 08:53	01/17/19 23:06	7005-72-3	
Chrysene	ND	ug/kg	7550	641	1	01/16/19 08:53	01/17/19 23:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	53-70-3	
Dibenzofuran	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	7550	572	1	01/16/19 08:53	01/17/19 23:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7550	641	1	01/16/19 08:53	01/17/19 23:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7550	664	1	01/16/19 08:53	01/17/19 23:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	15100	2590	1	01/16/19 08:53	01/17/19 23:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	120-83-2	
Diethylphthalate	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	7550	412	1	01/16/19 08:53	01/17/19 23:06	105-67-9	
Dimethylphthalate	ND	ug/kg	7550	733	1	01/16/19 08:53	01/17/19 23:06	131-11-3	
Di-n-butylphthalate	ND	ug/kg	7550	801	1	01/16/19 08:53	01/17/19 23:06	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-4 Lab ID: 60291978004 Collected: 01/11/19 12:50 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	38200	1010	1	01/16/19 08:53	01/17/19 23:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	38200	1100	1	01/16/19 08:53	01/17/19 23:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	7550	641	1	01/16/19 08:53	01/17/19 23:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	7550	778	1	01/16/19 08:53	01/17/19 23:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	7550	893	1	01/16/19 08:53	01/17/19 23:06	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	7550	2610	1	01/16/19 08:53	01/17/19 23:06	117-81-7	
Fluoranthene	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	206-44-0	
Fluorene	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	7550	755	1	01/16/19 08:53	01/17/19 23:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	7550	733	1	01/16/19 08:53	01/17/19 23:06	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	7550	1600	1	01/16/19 08:53	01/17/19 23:06	77-47-4	
Hexachloroethane	ND	ug/kg	7550	572	1	01/16/19 08:53	01/17/19 23:06	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7550	824	1	01/16/19 08:53	01/17/19 23:06	193-39-5	
Isophorone	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	78-59-1	
2-Methylnaphthalene	ND	ug/kg	7550	549	1	01/16/19 08:53	01/17/19 23:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	20500	ug/kg	7550	824	1	01/16/19 08:53	01/17/19 23:06		
Naphthalene	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	91-20-3	
2-Nitroaniline	ND	ug/kg	15100	1280	1	01/16/19 08:53	01/17/19 23:06	88-74-4	
3-Nitroaniline	ND	ug/kg	15100	2290	1	01/16/19 08:53	01/17/19 23:06	99-09-2	
4-Nitroaniline	ND	ug/kg	15100	1950	1	01/16/19 08:53	01/17/19 23:06	100-01-6	
Nitrobenzene	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	98-95-3	
2-Nitrophenol	ND	ug/kg	7550	1050	1	01/16/19 08:53	01/17/19 23:06	88-75-5	
4-Nitrophenol	ND	ug/kg	38200	1190	1	01/16/19 08:53	01/17/19 23:06	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	7550	755	1	01/16/19 08:53	01/17/19 23:06	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	86-30-6	
Pentachlorophenol	ND	ug/kg	38200	710	1	01/16/19 08:53	01/17/19 23:06	87-86-5	
Phenanthrene	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	85-01-8	
Phenol	16400	ug/kg	7550	595	1	01/16/19 08:53	01/17/19 23:06	108-95-2	
Pyrene	ND	ug/kg	7550	755	1	01/16/19 08:53	01/17/19 23:06	129-00-0	
Pyridine	ND	ug/kg	7550	618	1	01/16/19 08:53	01/17/19 23:06	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	7550	687	1	01/16/19 08:53	01/17/19 23:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	7550	710	1	01/16/19 08:53	01/17/19 23:06	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	64	%	35-119		1	01/16/19 08:53	01/17/19 23:06	4165-60-0	P3
2-Fluorobiphenyl (S)	59	%	55-110		1	01/16/19 08:53	01/17/19 23:06	321-60-8	
Terphenyl-d14 (S)	77	%	45-114		1	01/16/19 08:53	01/17/19 23:06	1718-51-0	
Phenol-d6 (S)	67	%	48-110		1	01/16/19 08:53	01/17/19 23:06	13127-88-3	
2-Fluorophenol (S)	68	%	46-108		1	01/16/19 08:53	01/17/19 23:06	367-12-4	
2,4,6-Tribromophenol (S)	52	%	35-119		1	01/16/19 08:53	01/17/19 23:06	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	6070	ug/kg	91.7	74.3	1		01/21/19 12:51	67-64-1	
Benzene	ND	ug/kg	22.9	2.3	1		01/21/19 12:51	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-4 Lab ID: 60291978004 Collected: 01/11/19 12:50 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	22.9	4.3	1		01/21/19 12:51	108-86-1	
Bromochloromethane	ND	ug/kg	22.9	2.8	1		01/21/19 12:51	74-97-5	
Bromodichloromethane	ND	ug/kg	22.9	2.8	1		01/21/19 12:51	75-27-4	
Bromoform	ND	ug/kg	22.9	2.6	1		01/21/19 12:51	75-25-2	
Bromomethane	ND	ug/kg	22.9	13.5	1		01/21/19 12:51	74-83-9	
2-Butanone (MEK)	251	ug/kg	45.9	15.6	1		01/21/19 12:51	78-93-3	
n-Butylbenzene	8.4J	ug/kg	22.9	3.0	1		01/21/19 12:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	22.9	3.4	1		01/21/19 12:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	22.9	4.0	1		01/21/19 12:51	98-06-6	
Carbon disulfide	21.5J	ug/kg	22.9	2.9	1		01/21/19 12:51	75-15-0	
Carbon tetrachloride	ND	ug/kg	22.9	3.9	1		01/21/19 12:51	56-23-5	
Chlorobenzene	ND	ug/kg	22.9	2.9	1		01/21/19 12:51	108-90-7	
Chloroethane	ND	ug/kg	22.9	6.9	1		01/21/19 12:51	75-00-3	
Chloroform	ND	ug/kg	22.9	2.3	1		01/21/19 12:51	67-66-3	
Chloromethane	ND	ug/kg	22.9	3.7	1		01/21/19 12:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	22.9	3.3	1		01/21/19 12:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	22.9	2.8	1		01/21/19 12:51	106-43-4	
1,2-Dibromo-3-chloropropane	24.7J	ug/kg	45.9	8.4	1		01/21/19 12:51	96-12-8	
Dibromochloromethane	ND	ug/kg	22.9	3.0	1		01/21/19 12:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	22.9	2.5	1		01/21/19 12:51	106-93-4	
Dibromomethane	ND	ug/kg	22.9	2.8	1		01/21/19 12:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	22.9	2.9	1		01/21/19 12:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	22.9	3.3	1		01/21/19 12:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	22.9	3.7	1		01/21/19 12:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	22.9	5.4	1		01/21/19 12:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	22.9	1.8	1		01/21/19 12:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	22.9	1.8	1		01/21/19 12:51	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	22.9	5.1	1		01/21/19 12:51	540-59-0	
1,1-Dichloroethene	ND	ug/kg	22.9	2.9	1		01/21/19 12:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	22.9	2.0	1		01/21/19 12:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	22.9	3.1	1		01/21/19 12:51	156-60-5	
1,2-Dichloropropane	ND	ug/kg	22.9	4.5	1		01/21/19 12:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	22.9	3.2	1		01/21/19 12:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	22.9	2.2	1		01/21/19 12:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	22.9	4.1	1		01/21/19 12:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	22.9	2.4	1		01/21/19 12:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	22.9	2.1	1		01/21/19 12:51	10061-02-6	
Ethylbenzene	ND	ug/kg	22.9	2.1	1		01/21/19 12:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	22.9	3.9	1		01/21/19 12:51	87-68-3	
n-Hexane	ND	ug/kg	22.9	11.5	1		01/21/19 12:51	110-54-3	
2-Hexanone	16.0J	ug/kg	91.7	11.4	1		01/21/19 12:51	591-78-6	
Isopropylbenzene (Cumene)	38.5	ug/kg	22.9	2.6	1		01/21/19 12:51	98-82-8	
p-Isopropyltoluene	513	ug/kg	22.9	3.2	1		01/21/19 12:51	99-87-6	
Methylene chloride	ND	ug/kg	22.9	12.6	1		01/21/19 12:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	45.9	13.9	1		01/21/19 12:51	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-4 Lab ID: 60291978004 Collected: 01/11/19 12:50 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Methyl-tert-butyl ether	ND	ug/kg	22.9	2.2	1		01/21/19 12:51	1634-04-4	
Naphthalene	37.0J	ug/kg	45.9	3.8	1		01/21/19 12:51	91-20-3	
n-Propylbenzene	ND	ug/kg	22.9	3.7	1		01/21/19 12:51	103-65-1	
Styrene	ND	ug/kg	22.9	2.7	1		01/21/19 12:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	22.9	4.7	1		01/21/19 12:51	630-20-6	
1,1,2,2-Tetrachloroethane	5.1J	ug/kg	22.9	4.6	1		01/21/19 12:51	79-34-5	
Tetrachloroethene	ND	ug/kg	22.9	1.9	1		01/21/19 12:51	127-18-4	
Toluene	2550	ug/kg	1150	81.0	50		01/22/19 11:50	108-88-3	
1,2,3-Trichlorobenzene	104	ug/kg	22.9	3.7	1		01/21/19 12:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	22.9	3.7	1		01/21/19 12:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	22.9	3.4	1		01/21/19 12:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	22.9	2.9	1		01/21/19 12:51	79-00-5	
Trichloroethene	ND	ug/kg	22.9	3.3	1		01/21/19 12:51	79-01-6	
Trichlorofluoromethane	ND	ug/kg	22.9	2.8	1		01/21/19 12:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	22.9	9.8	1		01/21/19 12:51	96-18-4	
1,2,4-Trimethylbenzene	17.3J	ug/kg	22.9	3.1	1		01/21/19 12:51	95-63-6	
1,3,5-Trimethylbenzene	5.1J	ug/kg	22.9	2.9	1		01/21/19 12:51	108-67-8	
Vinyl chloride	ND	ug/kg	22.9	3.1	1		01/21/19 12:51	75-01-4	
Xylene (Total)	ND	ug/kg	22.9	5.2	1		01/21/19 12:51	1330-20-7	
Surrogates									
Toluene-d8 (S)	103	%	78-122		1		01/21/19 12:51	2037-26-5	
4-Bromofluorobenzene (S)	116	%	69-133		1		01/21/19 12:51	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	80-123		1		01/21/19 12:51	17060-07-0	
Percent Moisture									
Analytical Method: ASTM D2974									
Percent Moisture	78.3	%	0.50	0.50	1		01/16/19 14:15		

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-5 Lab ID: 60291978005 Collected: 01/11/19 13:00 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	ND	mg/kg	2.4	1.1	1	01/16/19 09:57	01/17/19 13:22	7440-38-2	
Barium	36.2	mg/kg	1.2	0.17	1	01/16/19 09:57	01/17/19 13:22	7440-39-3	
Cadmium	ND	mg/kg	1.2	0.16	1	01/16/19 09:57	01/17/19 13:22	7440-43-9	
Chromium	69.1	mg/kg	1.2	0.34	1	01/16/19 09:57	01/17/19 13:22	7440-47-3	
Lead	2.8	mg/kg	1.2	0.94	1	01/16/19 09:57	01/17/19 13:22	7439-92-1	
Selenium	ND	mg/kg	3.6	1.3	1	01/16/19 09:57	01/17/19 13:22	7782-49-2	
Silver	ND	mg/kg	1.7	0.32	1	01/16/19 09:57	01/17/19 13:22	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.13	0.047	1	01/16/19 12:20	01/17/19 11:10	7439-97-6	
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	5570	591	1	01/16/19 08:53	01/17/19 23:27	83-32-9	
Acenaphthylene	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	208-96-8	
Anthracene	ND	ug/kg	5570	591	1	01/16/19 08:53	01/17/19 23:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	56-55-3	
Benzo(a)pyrene	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	5570	388	1	01/16/19 08:53	01/17/19 23:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	5570	540	1	01/16/19 08:53	01/17/19 23:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	5570	659	1	01/16/19 08:53	01/17/19 23:27	207-08-9	
Benzoic acid	ND	ug/kg	28200	523	1	01/16/19 08:53	01/17/19 23:27	65-85-0	
Benzyl alcohol	ND	ug/kg	11100	1740	1	01/16/19 08:53	01/17/19 23:27	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	101-55-3	
Butylbenzylphthalate	ND	ug/kg	5570	726	1	01/16/19 08:53	01/17/19 23:27	85-68-7	
Carbazole	ND	ug/kg	5570	456	1	01/16/19 08:53	01/17/19 23:27	86-74-8	N2
4-Chloro-3-methylphenol	ND	ug/kg	11100	608	1	01/16/19 08:53	01/17/19 23:27	59-50-7	
4-Chloroaniline	ND	ug/kg	11100	1100	1	01/16/19 08:53	01/17/19 23:27	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	5570	473	1	01/16/19 08:53	01/17/19 23:27	91-58-7	
2-Chlorophenol	ND	ug/kg	5570	456	1	01/16/19 08:53	01/17/19 23:27	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	5570	540	1	01/16/19 08:53	01/17/19 23:27	7005-72-3	
Chrysene	ND	ug/kg	5570	473	1	01/16/19 08:53	01/17/19 23:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	53-70-3	
Dibenzofuran	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	5570	422	1	01/16/19 08:53	01/17/19 23:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5570	473	1	01/16/19 08:53	01/17/19 23:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5570	490	1	01/16/19 08:53	01/17/19 23:27	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	11100	1910	1	01/16/19 08:53	01/17/19 23:27	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	120-83-2	
Diethylphthalate	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	5570	304	1	01/16/19 08:53	01/17/19 23:27	105-67-9	
Dimethylphthalate	ND	ug/kg	5570	540	1	01/16/19 08:53	01/17/19 23:27	131-11-3	
Di-n-butylphthalate	ND	ug/kg	5570	591	1	01/16/19 08:53	01/17/19 23:27	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-5 Lab ID: 60291978005 Collected: 01/11/19 13:00 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	28200	743	1	01/16/19 08:53	01/17/19 23:27	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	28200	811	1	01/16/19 08:53	01/17/19 23:27	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	5570	473	1	01/16/19 08:53	01/17/19 23:27	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	5570	574	1	01/16/19 08:53	01/17/19 23:27	606-20-2	
Di-n-octylphthalate	ND	ug/kg	5570	659	1	01/16/19 08:53	01/17/19 23:27	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	5570	1920	1	01/16/19 08:53	01/17/19 23:27	117-81-7	
Fluoranthene	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	206-44-0	
Fluorene	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	5570	557	1	01/16/19 08:53	01/17/19 23:27	87-68-3	
Hexachlorobenzene	ND	ug/kg	5570	540	1	01/16/19 08:53	01/17/19 23:27	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	5570	1180	1	01/16/19 08:53	01/17/19 23:27	77-47-4	
Hexachloroethane	ND	ug/kg	5570	422	1	01/16/19 08:53	01/17/19 23:27	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	5570	608	1	01/16/19 08:53	01/17/19 23:27	193-39-5	
Isophorone	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	78-59-1	
2-Methylnaphthalene	ND	ug/kg	5570	405	1	01/16/19 08:53	01/17/19 23:27	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	95-48-7	
3&4-Methylphenol(m&p Cresol)	35500	ug/kg	5570	608	1	01/16/19 08:53	01/17/19 23:27		
Naphthalene	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	91-20-3	
2-Nitroaniline	ND	ug/kg	11100	946	1	01/16/19 08:53	01/17/19 23:27	88-74-4	
3-Nitroaniline	ND	ug/kg	11100	1690	1	01/16/19 08:53	01/17/19 23:27	99-09-2	
4-Nitroaniline	ND	ug/kg	11100	1440	1	01/16/19 08:53	01/17/19 23:27	100-01-6	
Nitrobenzene	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	98-95-3	
2-Nitrophenol	ND	ug/kg	5570	777	1	01/16/19 08:53	01/17/19 23:27	88-75-5	
4-Nitrophenol	ND	ug/kg	28200	878	1	01/16/19 08:53	01/17/19 23:27	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	5570	557	1	01/16/19 08:53	01/17/19 23:27	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	86-30-6	
Pentachlorophenol	ND	ug/kg	28200	523	1	01/16/19 08:53	01/17/19 23:27	87-86-5	
Phenanthrene	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	85-01-8	
Phenol	12700	ug/kg	5570	439	1	01/16/19 08:53	01/17/19 23:27	108-95-2	
Pyrene	ND	ug/kg	5570	557	1	01/16/19 08:53	01/17/19 23:27	129-00-0	
Pyridine	ND	ug/kg	5570	456	1	01/16/19 08:53	01/17/19 23:27	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	5570	507	1	01/16/19 08:53	01/17/19 23:27	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	5570	523	1	01/16/19 08:53	01/17/19 23:27	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	75	%	35-119		1	01/16/19 08:53	01/17/19 23:27	4165-60-0	P3
2-Fluorobiphenyl (S)	68	%	55-110		1	01/16/19 08:53	01/17/19 23:27	321-60-8	
Terphenyl-d14 (S)	83	%	45-114		1	01/16/19 08:53	01/17/19 23:27	1718-51-0	
Phenol-d6 (S)	80	%	48-110		1	01/16/19 08:53	01/17/19 23:27	13127-88-3	
2-Fluorophenol (S)	82	%	46-108		1	01/16/19 08:53	01/17/19 23:27	367-12-4	
2,4,6-Tribromophenol (S)	61	%	35-119		1	01/16/19 08:53	01/17/19 23:27	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	1680	ug/kg	68.4	55.4	1		01/21/19 13:06	67-64-1	
Benzene	ND	ug/kg	17.1	1.7	1		01/21/19 13:06	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-5 Lab ID: 60291978005 Collected: 01/11/19 13:00 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	17.1	3.2	1		01/21/19 13:06	108-86-1	
Bromochloromethane	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	74-97-5	
Bromodichloromethane	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	75-27-4	
Bromoform	ND	ug/kg	17.1	2.0	1		01/21/19 13:06	75-25-2	
Bromomethane	ND	ug/kg	17.1	10.1	1		01/21/19 13:06	74-83-9	
2-Butanone (MEK)	1560	ug/kg	34.2	11.7	1		01/21/19 13:06	78-93-3	
n-Butylbenzene	4.0J	ug/kg	17.1	2.2	1		01/21/19 13:06	104-51-8	
sec-Butylbenzene	ND	ug/kg	17.1	2.5	1		01/21/19 13:06	135-98-8	
tert-Butylbenzene	ND	ug/kg	17.1	3.0	1		01/21/19 13:06	98-06-6	
Carbon disulfide	15.2J	ug/kg	17.1	2.2	1		01/21/19 13:06	75-15-0	
Carbon tetrachloride	ND	ug/kg	17.1	2.9	1		01/21/19 13:06	56-23-5	
Chlorobenzene	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	108-90-7	
Chloroethane	ND	ug/kg	17.1	5.1	1		01/21/19 13:06	75-00-3	
Chloroform	ND	ug/kg	17.1	1.7	1		01/21/19 13:06	67-66-3	
Chloromethane	ND	ug/kg	17.1	2.7	1		01/21/19 13:06	74-87-3	
2-Chlorotoluene	ND	ug/kg	17.1	2.5	1		01/21/19 13:06	95-49-8	
4-Chlorotoluene	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	34.2	6.3	1		01/21/19 13:06	96-12-8	
Dibromochloromethane	ND	ug/kg	17.1	2.2	1		01/21/19 13:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	17.1	1.8	1		01/21/19 13:06	106-93-4	
Dibromomethane	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	17.1	2.5	1		01/21/19 13:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	17.1	2.8	1		01/21/19 13:06	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	17.1	4.0	1		01/21/19 13:06	75-71-8	
1,1-Dichloroethane	ND	ug/kg	17.1	1.3	1		01/21/19 13:06	75-34-3	
1,2-Dichloroethane	ND	ug/kg	17.1	1.4	1		01/21/19 13:06	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	17.1	3.8	1		01/21/19 13:06	540-59-0	
1,1-Dichloroethene	ND	ug/kg	17.1	2.2	1		01/21/19 13:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	17.1	1.5	1		01/21/19 13:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	17.1	2.3	1		01/21/19 13:06	156-60-5	
1,2-Dichloropropane	ND	ug/kg	17.1	3.3	1		01/21/19 13:06	78-87-5	
1,3-Dichloropropane	ND	ug/kg	17.1	2.4	1		01/21/19 13:06	142-28-9	
2,2-Dichloropropane	ND	ug/kg	17.1	1.6	1		01/21/19 13:06	594-20-7	
1,1-Dichloropropene	ND	ug/kg	17.1	3.1	1		01/21/19 13:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	17.1	1.8	1		01/21/19 13:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	17.1	1.6	1		01/21/19 13:06	10061-02-6	
Ethylbenzene	ND	ug/kg	17.1	1.6	1		01/21/19 13:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	17.1	2.9	1		01/21/19 13:06	87-68-3	
n-Hexane	ND	ug/kg	17.1	8.5	1		01/21/19 13:06	110-54-3	
2-Hexanone	70.5	ug/kg	68.4	8.5	1		01/21/19 13:06	591-78-6	
Isopropylbenzene (Cumene)	25.3	ug/kg	17.1	1.9	1		01/21/19 13:06	98-82-8	
p-Isopropyltoluene	274	ug/kg	17.1	2.4	1		01/21/19 13:06	99-87-6	
Methylene chloride	ND	ug/kg	17.1	9.4	1		01/21/19 13:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	34.2	10.4	1		01/21/19 13:06	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-5 Lab ID: 60291978005 Collected: 01/11/19 13:00 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Methyl-tert-butyl ether	ND	ug/kg	17.1	1.6	1		01/21/19 13:06	1634-04-4	
Naphthalene	13.1J	ug/kg	34.2	2.8	1		01/21/19 13:06	91-20-3	
n-Propylbenzene	ND	ug/kg	17.1	2.7	1		01/21/19 13:06	103-65-1	
Styrene	ND	ug/kg	17.1	2.0	1		01/21/19 13:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	17.1	3.5	1		01/21/19 13:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	17.1	3.4	1		01/21/19 13:06	79-34-5	
Tetrachloroethene	ND	ug/kg	17.1	1.4	1		01/21/19 13:06	127-18-4	
Toluene	880	ug/kg	17.1	1.2	1		01/21/19 13:06	108-88-3	
1,2,3-Trichlorobenzene	48.8	ug/kg	17.1	2.7	1		01/21/19 13:06	87-61-6	
1,2,4-Trichlorobenzene	4.3J	ug/kg	17.1	2.7	1		01/21/19 13:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	17.1	2.6	1		01/21/19 13:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	17.1	2.2	1		01/21/19 13:06	79-00-5	
Trichloroethene	ND	ug/kg	17.1	2.5	1		01/21/19 13:06	79-01-6	
Trichlorofluoromethane	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	17.1	7.3	1		01/21/19 13:06	96-18-4	
1,2,4-Trimethylbenzene	10.7J	ug/kg	17.1	2.3	1		01/21/19 13:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	17.1	2.1	1		01/21/19 13:06	108-67-8	
Vinyl chloride	ND	ug/kg	17.1	2.3	1		01/21/19 13:06	75-01-4	
Xylene (Total)	ND	ug/kg	17.1	3.9	1		01/21/19 13:06	1330-20-7	
Surrogates									
Toluene-d8 (S)	103	%	78-122		1		01/21/19 13:06	2037-26-5	
4-Bromofluorobenzene (S)	109	%	69-133		1		01/21/19 13:06	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	80-123		1		01/21/19 13:06	17060-07-0	
Percent Moisture									
Analytical Method: ASTM D2974									
Percent Moisture	70.9	%	0.50	0.50	1		01/16/19 14:15		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-6 Lab ID: 60291978006 Collected: 01/11/19 13:15 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Red. Interference		Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	2.2J	mg/kg	3.6	1.6	1	01/16/19 09:57	01/17/19 13:25	7440-38-2	
Barium	76.1	mg/kg	1.8	0.25	1	01/16/19 09:57	01/17/19 13:25	7440-39-3	
Cadmium	ND	mg/kg	1.8	0.24	1	01/16/19 09:57	01/17/19 13:25	7440-43-9	
Chromium	111	mg/kg	1.8	0.51	1	01/16/19 09:57	01/17/19 13:25	7440-47-3	
Lead	2.4	mg/kg	1.8	1.4	1	01/16/19 09:57	01/17/19 13:25	7439-92-1	
Selenium	2.0J	mg/kg	5.3	2.0	1	01/16/19 09:57	01/17/19 13:25	7782-49-2	
Silver	ND	mg/kg	2.5	0.49	1	01/16/19 09:57	01/17/19 13:25	7440-22-4	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.17	0.063	1	01/16/19 12:20	01/17/19 11:14	7439-97-6	
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	7760	823	1	01/16/19 08:53	01/17/19 23:49	83-32-9	
Acenaphthylene	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	208-96-8	
Anthracene	ND	ug/kg	7760	823	1	01/16/19 08:53	01/17/19 23:49	120-12-7	
Benzo(a)anthracene	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	56-55-3	
Benzo(a)pyrene	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	7760	541	1	01/16/19 08:53	01/17/19 23:49	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	7760	753	1	01/16/19 08:53	01/17/19 23:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	7760	918	1	01/16/19 08:53	01/17/19 23:49	207-08-9	
Benzoic acid	ND	ug/kg	39300	729	1	01/16/19 08:53	01/17/19 23:49	65-85-0	
Benzyl alcohol	ND	ug/kg	15500	2420	1	01/16/19 08:53	01/17/19 23:49	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	7760	1010	1	01/16/19 08:53	01/17/19 23:49	85-68-7	
Carbazole	ND	ug/kg	7760	635	1	01/16/19 08:53	01/17/19 23:49	86-74-8	N2
4-Chloro-3-methylphenol	ND	ug/kg	15500	847	1	01/16/19 08:53	01/17/19 23:49	59-50-7	
4-Chloroaniline	ND	ug/kg	15500	1530	1	01/16/19 08:53	01/17/19 23:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	7760	659	1	01/16/19 08:53	01/17/19 23:49	91-58-7	
2-Chlorophenol	ND	ug/kg	7760	635	1	01/16/19 08:53	01/17/19 23:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	7760	753	1	01/16/19 08:53	01/17/19 23:49	7005-72-3	
Chrysene	ND	ug/kg	7760	659	1	01/16/19 08:53	01/17/19 23:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	53-70-3	
Dibenzofuran	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	7760	588	1	01/16/19 08:53	01/17/19 23:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	7760	659	1	01/16/19 08:53	01/17/19 23:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	7760	682	1	01/16/19 08:53	01/17/19 23:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	15500	2660	1	01/16/19 08:53	01/17/19 23:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	120-83-2	
Diethylphthalate	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	7760	424	1	01/16/19 08:53	01/17/19 23:49	105-67-9	
Dimethylphthalate	ND	ug/kg	7760	753	1	01/16/19 08:53	01/17/19 23:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	7760	823	1	01/16/19 08:53	01/17/19 23:49	84-74-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-6 Lab ID: 60291978006 Collected: 01/11/19 13:15 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles		Analytical Method: EPA 8270 Preparation Method: EPA 3546							
4,6-Dinitro-2-methylphenol	ND	ug/kg	39300	1040	1	01/16/19 08:53	01/17/19 23:49	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	39300	1130	1	01/16/19 08:53	01/17/19 23:49	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	7760	659	1	01/16/19 08:53	01/17/19 23:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	7760	800	1	01/16/19 08:53	01/17/19 23:49	606-20-2	
Di-n-octylphthalate	ND	ug/kg	7760	918	1	01/16/19 08:53	01/17/19 23:49	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	7760	2680	1	01/16/19 08:53	01/17/19 23:49	117-81-7	
Fluoranthene	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	206-44-0	
Fluorene	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	7760	776	1	01/16/19 08:53	01/17/19 23:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	7760	753	1	01/16/19 08:53	01/17/19 23:49	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	7760	1650	1	01/16/19 08:53	01/17/19 23:49	77-47-4	
Hexachloroethane	ND	ug/kg	7760	588	1	01/16/19 08:53	01/17/19 23:49	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	7760	847	1	01/16/19 08:53	01/17/19 23:49	193-39-5	
Isophorone	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	78-59-1	
2-Methylnaphthalene	ND	ug/kg	7760	565	1	01/16/19 08:53	01/17/19 23:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	95-48-7	
3&4-Methylphenol(m&p Cresol)	84000	ug/kg	15500	1690	2	01/16/19 08:53	01/22/19 03:08		
Naphthalene	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	91-20-3	
2-Nitroaniline	ND	ug/kg	15500	1320	1	01/16/19 08:53	01/17/19 23:49	88-74-4	
3-Nitroaniline	ND	ug/kg	15500	2350	1	01/16/19 08:53	01/17/19 23:49	99-09-2	
4-Nitroaniline	ND	ug/kg	15500	2000	1	01/16/19 08:53	01/17/19 23:49	100-01-6	
Nitrobenzene	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	98-95-3	
2-Nitrophenol	ND	ug/kg	7760	1080	1	01/16/19 08:53	01/17/19 23:49	88-75-5	
4-Nitrophenol	ND	ug/kg	39300	1220	1	01/16/19 08:53	01/17/19 23:49	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	7760	776	1	01/16/19 08:53	01/17/19 23:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	86-30-6	
Pentachlorophenol	ND	ug/kg	39300	729	1	01/16/19 08:53	01/17/19 23:49	87-86-5	
Phenanthrene	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	85-01-8	
Phenol	33300	ug/kg	7760	612	1	01/16/19 08:53	01/17/19 23:49	108-95-2	
Pyrene	ND	ug/kg	7760	776	1	01/16/19 08:53	01/17/19 23:49	129-00-0	
Pyridine	ND	ug/kg	7760	635	1	01/16/19 08:53	01/17/19 23:49	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	7760	706	1	01/16/19 08:53	01/17/19 23:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	7760	729	1	01/16/19 08:53	01/17/19 23:49	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	69	%	35-119		1	01/16/19 08:53	01/17/19 23:49	4165-60-0	P3
2-Fluorobiphenyl (S)	64	%	55-110		1	01/16/19 08:53	01/17/19 23:49	321-60-8	
Terphenyl-d14 (S)	84	%	45-114		1	01/16/19 08:53	01/17/19 23:49	1718-51-0	
Phenol-d6 (S)	75	%	48-110		1	01/16/19 08:53	01/17/19 23:49	13127-88-3	
2-Fluorophenol (S)	77	%	46-108		1	01/16/19 08:53	01/17/19 23:49	367-12-4	
2,4,6-Tribromophenol (S)	57	%	35-119		1	01/16/19 08:53	01/17/19 23:49	118-79-6	
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Acetone	3210	ug/kg	95.1	77.1	1		01/21/19 13:22	67-64-1	
Benzene	ND	ug/kg	23.8	2.3	1		01/21/19 13:22	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-6 Lab ID: 60291978006 Collected: 01/11/19 13:15 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	23.8	4.5	1		01/21/19 13:22	108-86-1	
Bromochloromethane	ND	ug/kg	23.8	2.9	1		01/21/19 13:22	74-97-5	
Bromodichloromethane	ND	ug/kg	23.8	2.9	1		01/21/19 13:22	75-27-4	
Bromoform	ND	ug/kg	23.8	2.7	1		01/21/19 13:22	75-25-2	
Bromomethane	ND	ug/kg	23.8	14.0	1		01/21/19 13:22	74-83-9	
2-Butanone (MEK)	138	ug/kg	47.6	16.2	1		01/21/19 13:22	78-93-3	
n-Butylbenzene	ND	ug/kg	23.8	3.1	1		01/21/19 13:22	104-51-8	
sec-Butylbenzene	ND	ug/kg	23.8	3.5	1		01/21/19 13:22	135-98-8	
tert-Butylbenzene	ND	ug/kg	23.8	4.2	1		01/21/19 13:22	98-06-6	
Carbon disulfide	20.6J	ug/kg	23.8	3.1	1		01/21/19 13:22	75-15-0	
Carbon tetrachloride	ND	ug/kg	23.8	4.1	1		01/21/19 13:22	56-23-5	
Chlorobenzene	ND	ug/kg	23.8	3.0	1		01/21/19 13:22	108-90-7	
Chloroethane	ND	ug/kg	23.8	7.1	1		01/21/19 13:22	75-00-3	
Chloroform	ND	ug/kg	23.8	2.3	1		01/21/19 13:22	67-66-3	
Chloromethane	ND	ug/kg	23.8	3.8	1		01/21/19 13:22	74-87-3	
2-Chlorotoluene	ND	ug/kg	23.8	3.5	1		01/21/19 13:22	95-49-8	
4-Chlorotoluene	ND	ug/kg	23.8	2.9	1		01/21/19 13:22	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	47.6	8.7	1		01/21/19 13:22	96-12-8	
Dibromochloromethane	ND	ug/kg	23.8	3.1	1		01/21/19 13:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	23.8	2.5	1		01/21/19 13:22	106-93-4	
Dibromomethane	ND	ug/kg	23.8	2.9	1		01/21/19 13:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	23.8	3.0	1		01/21/19 13:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	23.8	3.4	1		01/21/19 13:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	23.8	3.9	1		01/21/19 13:22	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	23.8	5.6	1		01/21/19 13:22	75-71-8	
1,1-Dichloroethane	ND	ug/kg	23.8	1.9	1		01/21/19 13:22	75-34-3	
1,2-Dichloroethane	ND	ug/kg	23.8	1.9	1		01/21/19 13:22	107-06-2	
1,2-Dichloroethylene (Total)	ND	ug/kg	23.8	5.3	1		01/21/19 13:22	540-59-0	
1,1-Dichloroethene	ND	ug/kg	23.8	3.0	1		01/21/19 13:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	23.8	2.1	1		01/21/19 13:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	23.8	3.2	1		01/21/19 13:22	156-60-5	
1,2-Dichloropropane	ND	ug/kg	23.8	4.7	1		01/21/19 13:22	78-87-5	
1,3-Dichloropropane	ND	ug/kg	23.8	3.3	1		01/21/19 13:22	142-28-9	
2,2-Dichloropropane	ND	ug/kg	23.8	2.3	1		01/21/19 13:22	594-20-7	
1,1-Dichloropropene	ND	ug/kg	23.8	4.3	1		01/21/19 13:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	23.8	2.5	1		01/21/19 13:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	23.8	2.2	1		01/21/19 13:22	10061-02-6	
Ethylbenzene	ND	ug/kg	23.8	2.2	1		01/21/19 13:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	23.8	4.0	1		01/21/19 13:22	87-68-3	
n-Hexane	ND	ug/kg	23.8	11.9	1		01/21/19 13:22	110-54-3	
2-Hexanone	ND	ug/kg	95.1	11.8	1		01/21/19 13:22	591-78-6	
Isopropylbenzene (Cumene)	33.9	ug/kg	23.8	2.7	1		01/21/19 13:22	98-82-8	
p-Isopropyltoluene	352	ug/kg	23.8	3.3	1		01/21/19 13:22	99-87-6	
Methylene chloride	ND	ug/kg	23.8	13.0	1		01/21/19 13:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	47.6	14.4	1		01/21/19 13:22	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Big Ox Energy
Pace Project No.: 60291978

Sample: DS-6 Lab ID: 60291978006 Collected: 01/11/19 13:15 Received: 01/15/19 09:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA		Analytical Method: EPA 8260							
Methyl-tert-butyl ether	ND	ug/kg	23.8	2.3	1		01/21/19 13:22	1634-04-4	
Naphthalene	13.0J	ug/kg	47.6	3.9	1		01/21/19 13:22	91-20-3	
n-Propylbenzene	ND	ug/kg	23.8	3.8	1		01/21/19 13:22	103-65-1	
Styrene	ND	ug/kg	23.8	2.8	1		01/21/19 13:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	23.8	4.9	1		01/21/19 13:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	23.8	4.8	1		01/21/19 13:22	79-34-5	
Tetrachloroethene	ND	ug/kg	23.8	2.0	1		01/21/19 13:22	127-18-4	
Toluene	ND	ug/kg	1200	84.4	50		01/22/19 12:06	108-88-3	
1,2,3-Trichlorobenzene	45.5	ug/kg	23.8	3.8	1		01/21/19 13:22	87-61-6	
1,2,4-Trichlorobenzene	5.1J	ug/kg	23.8	3.8	1		01/21/19 13:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	23.8	3.6	1		01/21/19 13:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	23.8	3.0	1		01/21/19 13:22	79-00-5	
Trichloroethene	ND	ug/kg	23.8	3.4	1		01/21/19 13:22	79-01-6	
Trichlorofluoromethane	ND	ug/kg	23.8	2.9	1		01/21/19 13:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	23.8	10.2	1		01/21/19 13:22	96-18-4	
1,2,4-Trimethylbenzene	8.4J	ug/kg	23.8	3.2	1		01/21/19 13:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	23.8	3.0	1		01/21/19 13:22	108-67-8	
Vinyl chloride	ND	ug/kg	23.8	3.2	1		01/21/19 13:22	75-01-4	
Xylene (Total)	ND	ug/kg	23.8	5.4	1		01/21/19 13:22	1330-20-7	
Surrogates									
Toluene-d8 (S)	104	%	78-122		1		01/21/19 13:22	2037-26-5	
4-Bromofluorobenzene (S)	111	%	69-133		1		01/21/19 13:22	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	80-123		1		01/21/19 13:22	17060-07-0	
Percent Moisture									
Analytical Method: ASTM D2974									
Percent Moisture	79.1	%	0.50	0.50	1		01/16/19 14:15		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

QC Batch:	564920	Analysis Method:	EPA 7471
QC Batch Method:	EPA 7471	Analysis Description:	7471 Mercury
Associated Lab Samples:	60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006		

METHOD BLANK: 2317829 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.050	0.019	01/17/19 10:47	

LABORATORY CONTROL SAMPLE: 2317830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.5	0.50	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317831 2317832

Parameter	Units	60291978001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
Mercury	mg/kg	ND	1.7	1.8	0.78	1.2	45	66	75-125	44	20	M1,R1

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

QC Batch: 564878 Analysis Method: EPA 6010

QC Batch Method: EPA 3050 Analysis Description: 6010 MET

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

METHOD BLANK: 2317702 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	ND	1.0	0.44	01/17/19 12:11	
Barium	mg/kg	0.22J	0.50	0.071	01/17/19 12:11	
Cadmium	mg/kg	ND	0.50	0.068	01/17/19 12:11	
Chromium	mg/kg	0.22J	0.50	0.14	01/17/19 12:11	
Lead	mg/kg	ND	0.50	0.39	01/17/19 12:11	
Selenium	mg/kg	ND	1.5	0.56	01/17/19 12:11	
Silver	mg/kg	ND	0.70	0.14	01/17/19 12:11	

LABORATORY CONTROL SAMPLE: 2317703

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	100	92.3	92	80-120	
Barium	mg/kg	100	96.2	96	80-120	
Cadmium	mg/kg	100	94.4	94	80-120	
Chromium	mg/kg	100	102	102	80-120	
Lead	mg/kg	100	100	100	80-120	
Selenium	mg/kg	100	96.4	96	80-120	
Silver	mg/kg	50	48.8	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317704 2317705

Parameter	Units	MS		MSD		MS Result	MS % Rec	MSD Result	MSD % Rec	% Rec Limits	RPD	RPD	Max Qual
		60291962008	Spike Conc.	Spike Conc.	MS Result								
Arsenic	mg/kg	10.7	120	120	119	119	90	90	90	75-125	1	20	
Barium	mg/kg	273	120	120	369	368	80	79	79	75-125	0	20	
Cadmium	mg/kg	1.7	120	120	112	111	91	91	91	75-125	0	20	
Chromium	mg/kg	22.1	120	120	144	144	102	102	101	75-125	1	20	
Lead	mg/kg	196	120	120	271	350	62	128	128	75-125	26	20	M1, R1
Selenium	mg/kg	ND	120	120	107	104	89	86	86	75-125	3	20	
Silver	mg/kg	ND	60.2	60.2	58.2	56.9	96	94	94	75-125	2	20	

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

QC Batch: 565289 Analysis Method: EPA 8260

QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics

Associated Lab Samples: 60291978001, 60291978002, 60291978003

METHOD BLANK: 2319414 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	5.0	1.0	01/18/19 10:16	
1,1,1-Trichloroethane	ug/kg	ND	5.0	0.75	01/18/19 10:16	
1,1,2,2-Tetrachloroethane	ug/kg	ND	5.0	1.0	01/18/19 10:16	
1,1,2-Trichloroethane	ug/kg	ND	5.0	0.63	01/18/19 10:16	
1,1-Dichloroethane	ug/kg	ND	5.0	0.39	01/18/19 10:16	
1,1-Dichloroethene	ug/kg	ND	5.0	0.64	01/18/19 10:16	
1,1-Dichloropropene	ug/kg	ND	5.0	0.90	01/18/19 10:16	
1,2,3-Trichlorobenzene	ug/kg	1.3J	5.0	0.80	01/18/19 10:16	
1,2,3-Trichloropropane	ug/kg	ND	5.0	2.1	01/18/19 10:16	
1,2,4-Trichlorobenzene	ug/kg	ND	5.0	0.80	01/18/19 10:16	
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	0.67	01/18/19 10:16	
1,2-Dibromo-3-chloropropane	ug/kg	ND	10.0	1.8	01/18/19 10:16	
1,2-Dibromoethane (EDB)	ug/kg	ND	5.0	0.54	01/18/19 10:16	
1,2-Dichlorobenzene	ug/kg	ND	5.0	0.62	01/18/19 10:16	
1,2-Dichloroethane	ug/kg	ND	5.0	0.40	01/18/19 10:16	
1,2-Dichloroethene (Total)	ug/kg	ND	5.0	1.1	01/18/19 10:16	
1,2-Dichloropropane	ug/kg	ND	5.0	0.98	01/18/19 10:16	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	0.63	01/18/19 10:16	
1,3-Dichlorobenzene	ug/kg	ND	5.0	0.72	01/18/19 10:16	
1,3-Dichloropropane	ug/kg	ND	5.0	0.69	01/18/19 10:16	
1,4-Dichlorobenzene	ug/kg	ND	5.0	0.81	01/18/19 10:16	
2,2-Dichloropropane	ug/kg	ND	5.0	0.48	01/18/19 10:16	
2-Butanone (MEK)	ug/kg	ND	10.0	3.4	01/18/19 10:16	
2-Chlorotoluene	ug/kg	ND	5.0	0.73	01/18/19 10:16	
2-Hexanone	ug/kg	3.9J	20.0	2.5	01/18/19 10:16	
4-Chlorotoluene	ug/kg	ND	5.0	0.60	01/18/19 10:16	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	10.0	3.0	01/18/19 10:16	
Acetone	ug/kg	ND	20.0	16.2	01/18/19 10:16	
Benzene	ug/kg	ND	5.0	0.49	01/18/19 10:16	
Bromobenzene	ug/kg	ND	5.0	0.94	01/18/19 10:16	
Bromochloromethane	ug/kg	ND	5.0	0.60	01/18/19 10:16	
Bromodichloromethane	ug/kg	ND	5.0	0.60	01/18/19 10:16	
Bromoform	ug/kg	ND	5.0	0.58	01/18/19 10:16	
Bromomethane	ug/kg	ND	5.0	2.9	01/18/19 10:16	
Carbon disulfide	ug/kg	ND	5.0	0.64	01/18/19 10:16	
Carbon tetrachloride	ug/kg	ND	5.0	0.86	01/18/19 10:16	
Chlorobenzene	ug/kg	ND	5.0	0.63	01/18/19 10:16	
Chloroethane	ug/kg	ND	5.0	1.5	01/18/19 10:16	
Chloroform	ug/kg	ND	5.0	0.49	01/18/19 10:16	
Chloromethane	ug/kg	ND	5.0	0.80	01/18/19 10:16	
cis-1,2-Dichloroethene	ug/kg	ND	5.0	0.43	01/18/19 10:16	

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

METHOD BLANK: 2319414 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/kg	ND	5.0	0.53	01/18/19 10:16	
Dibromochloromethane	ug/kg	ND	5.0	0.65	01/18/19 10:16	
Dibromomethane	ug/kg	ND	5.0	0.60	01/18/19 10:16	
Dichlorodifluoromethane	ug/kg	ND	5.0	1.2	01/18/19 10:16	
Ethylbenzene	ug/kg	ND	5.0	0.46	01/18/19 10:16	
Hexachloro-1,3-butadiene	ug/kg	ND	5.0	0.85	01/18/19 10:16	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	0.57	01/18/19 10:16	
Methyl-tert-butyl ether	ug/kg	ND	5.0	0.48	01/18/19 10:16	
Methylene chloride	ug/kg	ND	5.0	2.7	01/18/19 10:16	
n-Butylbenzene	ug/kg	ND	5.0	0.65	01/18/19 10:16	
n-Hexane	ug/kg	ND	5.0	2.5	01/18/19 10:16	
n-Propylbenzene	ug/kg	ND	5.0	0.80	01/18/19 10:16	
Naphthalene	ug/kg	1.8J	10.0	0.82	01/18/19 10:16	
p-Isopropyltoluene	ug/kg	ND	5.0	0.69	01/18/19 10:16	
sec-Butylbenzene	ug/kg	ND	5.0	0.73	01/18/19 10:16	
Styrene	ug/kg	ND	5.0	0.59	01/18/19 10:16	
tert-Butylbenzene	ug/kg	ND	5.0	0.88	01/18/19 10:16	
Tetrachloroethene	ug/kg	ND	5.0	0.41	01/18/19 10:16	
Toluene	ug/kg	ND	5.0	0.35	01/18/19 10:16	
trans-1,2-Dichloroethene	ug/kg	ND	5.0	0.68	01/18/19 10:16	
trans-1,3-Dichloropropene	ug/kg	ND	5.0	0.46	01/18/19 10:16	
Trichloroethene	ug/kg	ND	5.0	0.72	01/18/19 10:16	
Trichlorofluoromethane	ug/kg	ND	5.0	0.61	01/18/19 10:16	
Vinyl chloride	ug/kg	ND	5.0	0.67	01/18/19 10:16	
Xylene (Total)	ug/kg	ND	5.0	1.1	01/18/19 10:16	
1,2-Dichloroethane-d4 (S)	%	101	80-123		01/18/19 10:16	
4-Bromofluorobenzene (S)	%	98	69-133		01/18/19 10:16	
Toluene-d8 (S)	%	100	78-122		01/18/19 10:16	

LABORATORY CONTROL SAMPLE: 2319415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	100	103	103	79-131	
1,1,1-Trichloroethane	ug/kg	100	109	109	75-138	
1,1,2,2-Tetrachloroethane	ug/kg	100	99.3	99	71-127	
1,1,2-Trichloroethane	ug/kg	100	99.8	100	77-118	
1,1-Dichloroethane	ug/kg	100	105	105	79-127	
1,1-Dichloroethene	ug/kg	100	113	113	66-135	
1,1-Dichloropropene	ug/kg	100	108	108	69-143	
1,2,3-Trichlorobenzene	ug/kg	100	107	107	78-122	
1,2,3-Trichloropropane	ug/kg	100	101	101	74-119	
1,2,4-Trichlorobenzene	ug/kg	100	107	107	71-129	
1,2,4-Trimethylbenzene	ug/kg	100	99.7	100	73-130	
1,2-Dibromo-3-chloropropane	ug/kg	100	107	107	72-139	

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2319415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/kg	100	104	104	81-121	
1,2-Dichlorobenzene	ug/kg	100	104	104	74-123	
1,2-Dichloroethane	ug/kg	100	99.4	99	77-117	
1,2-Dichloroethene (Total)	ug/kg	200	211	106	77-127	
1,2-Dichloropropane	ug/kg	100	101	101	70-126	
1,3,5-Trimethylbenzene	ug/kg	100	101	101	74-131	
1,3-Dichlorobenzene	ug/kg	100	103	103	75-124	
1,3-Dichloropropane	ug/kg	100	96.9	97	80-121	
1,4-Dichlorobenzene	ug/kg	100	101	101	74-125	
2,2-Dichloropropane	ug/kg	100	111	111	70-146	
2-Butanone (MEK)	ug/kg	500	497	99	66-121	
2-Chlorotoluene	ug/kg	100	99.6	100	75-127	
2-Hexanone	ug/kg	500	513	103	67-124	
4-Chlorotoluene	ug/kg	100	99.7	100	70-130	
4-Methyl-2-pentanone (MIBK)	ug/kg	500	512	102	70-120	
Acetone	ug/kg	500	490	98	60-134	
Benzene	ug/kg	100	103	103	77-122	
Bromobenzene	ug/kg	100	100	100	79-121	
Bromochloromethane	ug/kg	100	95.0	95	74-123	
Bromodichloromethane	ug/kg	100	105	105	80-133	
Bromoform	ug/kg	100	107	107	76-150	
Bromomethane	ug/kg	100	99.5	100	24-174	
Carbon disulfide	ug/kg	100	112	112	59-145	
Carbon tetrachloride	ug/kg	100	111	111	73-150	
Chlorobenzene	ug/kg	100	102	102	76-123	
Chloroethane	ug/kg	100	116	116	34-164	
Chloroform	ug/kg	100	105	105	80-122	
Chloromethane	ug/kg	100	141	141	10-170	
cis-1,2-Dichloroethene	ug/kg	100	103	103	81-121	
cis-1,3-Dichloropropene	ug/kg	100	106	106	71-137	
Dibromochloromethane	ug/kg	100	107	107	78-137	
Dibromomethane	ug/kg	100	104	104	82-119	
Dichlorodifluoromethane	ug/kg	100	172	172	10-186	
Ethylbenzene	ug/kg	100	101	101	74-126	
Hexachloro-1,3-butadiene	ug/kg	100	106	106	68-146	
Isopropylbenzene (Cumene)	ug/kg	100	101	101	75-133	
Methyl-tert-butyl ether	ug/kg	100	109	109	74-120	
Methylene chloride	ug/kg	100	104	104	64-138	
n-Butylbenzene	ug/kg	100	111	111	70-140	
n-Hexane	ug/kg	100	126	126	55-142	
n-Propylbenzene	ug/kg	100	103	103	72-134	
Naphthalene	ug/kg	100	105	105	73-117	
p-Isopropyltoluene	ug/kg	100	103	103	72-135	
sec-Butylbenzene	ug/kg	100	112	112	72-132	
Styrene	ug/kg	100	102	102	77-127	
tert-Butylbenzene	ug/kg	100	104	104	74-133	
Tetrachloroethene	ug/kg	100	107	107	75-135	

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2319415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	100	113	113	73-122	
trans-1,2-Dichloroethene	ug/kg	100	108	108	71-134	
trans-1,3-Dichloropropene	ug/kg	100	107	107	72-142	
Trichloroethene	ug/kg	100	112	112	73-127	
Trichlorofluoromethane	ug/kg	100	105	105	55-155	
Vinyl chloride	ug/kg	100	170	170	36-162 L1	
Xylene (Total)	ug/kg	300	325	108	75-123	
1,2-Dichloroethane-d4 (S)	%			101	80-123	
4-Bromofluorobenzene (S)	%			96	69-133	
Toluene-d8 (S)	%			100	78-122	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2319416 2319417

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max		
		60291962013	Result	Spike Conc.	Conc.				RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/kg	ND	105	105	72.9	63.6	70	61	33-130	14	34
1,1,1-Trichloroethane	ug/kg	ND	105	105	86.1	78.6	82	75	45-129	9	45
1,1,2,2-Tetrachloroethane	ug/kg	ND	105	105	78.1	70.5	75	67	5-157	10	41
1,1,2-Trichloroethane	ug/kg	ND	105	105	82.4	78.0	79	74	28-133	5	32
1,1-Dichloroethane	ug/kg	ND	105	105	92.3	86.2	88	82	43-126	7	32
1,1-Dichloroethene	ug/kg	ND	105	105	91.0	83.9	87	80	33-132	8	38
1,1-Dichloropropene	ug/kg	ND	105	105	78.0	72.1	74	69	36-132	8	36
1,2,3-Trichlorobenzene	ug/kg	ND	105	105	42.0	21.4	40	20	10-135	65	45 R1
1,2,3-Trichloropropane	ug/kg	ND	105	105	84.4	75.8	81	72	15-153	11	35
1,2,4-Trichlorobenzene	ug/kg	ND	105	105	43.4	22.1	41	21	10-135	65	43 R1
1,2,4-Trimethylbenzene	ug/kg	ND	105	105	58.4	39.3	56	37	15-129	39	41
1,2-Dibromo-3-chloropropane	ug/kg	ND	105	105	77.9	63.7	74	61	10-155	20	38
1,2-Dibromoethane (EDB)	ug/kg	ND	105	105	82.4	76.0	79	73	38-128	8	32
1,2-Dichlorobenzene	ug/kg	ND	105	105	59.1	39.3	56	37	12-132	40	38 R1
1,2-Dichloroethane	ug/kg	ND	105	105	86.7	80.8	83	77	45-117	7	29
1,2-Dichloroethene (Total)	ug/kg	ND	210	210	181	168	86	80	37-127	7	33
1,2-Dichloropropane	ug/kg	ND	105	105	84.1	78.1	80	75	46-116	7	31
1,3,5-Trimethylbenzene	ug/kg	ND	105	105	59.1	39.8	56	38	19-130	39	38 R1
1,3-Dichlorobenzene	ug/kg	ND	105	105	57.5	38.4	55	37	14-130	40	39 R1
1,3-Dichloropropane	ug/kg	ND	105	105	79.8	74.1	76	71	38-124	7	31
1,4-Dichlorobenzene	ug/kg	ND	105	105	56.4	37.6	54	36	12-130	40	39 R1
2,2-Dichloropropane	ug/kg	ND	105	105	90.9	82.8	87	79	37-135	9	33
2-Butanone (MEK)	ug/kg	ND	524	524	465	477	89	91	32-130	3	33
2-Chlorotoluene	ug/kg	ND	105	105	60.9	44.4	58	42	18-133	31	38
2-Hexanone	ug/kg	ND	524	524	463	452	88	86	31-131	2	32
4-Chlorotoluene	ug/kg	ND	105	105	59.4	43.5	57	41	24-128	31	39
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	524	524	460	451	88	86	38-129	2	30
Acetone	ug/kg	ND	524	524	472	452	88	84	25-143	4	39
Benzene	ug/kg	ND	105	105	83.9	77.5	80	74	51-124	8	28

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

Parameter	Units	60291962013		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Max Qual
		Result	Conc.	Spike	Conc.	Spike	Result	MSD	Result	% Rec	MSD					
Bromobenzene	ug/kg	ND	105	105	66.2	51.5	63	49	21-130	25	39					
Bromoform	ug/kg	ND	105	105	77.7	68.1	74	65	25-142	13	37					
Bromochloromethane	ug/kg	ND	105	105	85.0	77.0	81	74	37-130	10	30					
Bromomethane	ug/kg	ND	105	105	74.3	75.0	71	72	10-158	1	47					
Carbon disulfide	ug/kg	ND	105	105	82.7	77.3	79	74	26-133	7	41					
Carbon tetrachloride	ug/kg	ND	105	105	80.8	71.9	77	69	40-136	12	35					
Chlorobenzene	ug/kg	ND	105	105	70.4	57.8	67	55	25-133	20	36					
Chloroethane	ug/kg	ND	105	105	103	95.4	98	91	10-160	7	42					
Chloroform	ug/kg	ND	105	105	90.4	84.1	86	80	47-119	7	31					
Chloromethane	ug/kg	ND	105	105	129	117	123	111	10-143	10	38					
cis-1,2-Dichloroethene	ug/kg	ND	105	105	90.3	83.5	86	80	45-125	8	32					
cis-1,3-Dichloropropene	ug/kg	ND	105	105	85.9	77.8	82	74	43-125	10	36					
Dibromochloromethane	ug/kg	ND	105	105	83.4	74.2	80	71	46-129	12	34					
Dibromomethane	ug/kg	ND	105	105	88.1	83.2	84	79	38-124	6	30					
Dichlorodifluoromethane	ug/kg	ND	105	105	125	120	119	114	10-156	4	40					
Ethylbenzene	ug/kg	ND	105	105	66.9	53.2	64	51	38-131	23	32					
Hexachloro-1,3-butadiene	ug/kg	ND	105	105	40.5	20.9	39	20	10-134	64	44	R1				
Isopropylbenzene (Cumene)	ug/kg	ND	105	105	61.1	45.0	58	43	26-129	30	37					
Methyl-tert-butyl ether	ug/kg	ND	105	105	96.9	93.7	92	89	49-120	3	41					
Methylene chloride	ug/kg	27.0	105	105	119	119	87	87	37-123	0	36					
n-Butylbenzene	ug/kg	ND	105	105	54.3	31.6	52	30	10-132	53	39	R1				
n-Hexane	ug/kg	ND	105	105	62.2	56.0	59	53	37-149	10	15					
n-Propylbenzene	ug/kg	ND	105	105	62.4	42.5	60	41	26-130	38	38					
Naphthalene	ug/kg	ND	105	105	51.7	33.6	48	31	10-144	42	41	R1				
p-Isopropyltoluene	ug/kg	ND	105	105	55.8	34.9	53	33	14-130	46	39	R1				
sec-Butylbenzene	ug/kg	ND	105	105	60.4	39.0	58	37	15-131	43	38	R1				
Styrene	ug/kg	ND	105	105	68.0	53.6	65	51	29-128	24	38					
tert-Butylbenzene	ug/kg	ND	105	105	59.0	40.4	56	39	26-133	37	39					
Tetrachloroethene	ug/kg	ND	105	105	68.0	55.7	65	53	31-132	20	38					
Toluene	ug/kg	ND	105	105	81.8	72.6	78	69	40-129	12	30					
trans-1,2-Dichloroethene	ug/kg	ND	105	105	90.3	84.6	86	81	40-126	6	36					
trans-1,3-Dichloropropene	ug/kg	ND	105	105	85.9	77.0	82	74	30-131	11	39					
Trichloroethene	ug/kg	ND	105	105	86.2	76.2	82	73	34-129	12	35					
Trichlorofluoromethane	ug/kg	ND	105	105	83.3	77.4	80	74	30-139	7	40					
Vinyl chloride	ug/kg	ND	105	105	147	139	140	133	17-139	6	42	M0				
Xylene (Total)	ug/kg	ND	314	314	208	160	66	51	32-133	26	43					
1,2-Dichloroethane-d4 (S)	%						101	104	80-123							
4-Bromofluorobenzene (S)	%						100	102	69-133							
Toluene-d8 (S)	%						100	101	78-122							

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

QC Batch: 565505 Analysis Method: EPA 8260

QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics

Associated Lab Samples: 60291978003, 60291978004, 60291978005, 60291978006

METHOD BLANK: 2320287

Matrix: Solid

Associated Lab Samples: 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	5.0	1.0	01/21/19 10:20	
1,1,1-Trichloroethane	ug/kg	ND	5.0	0.75	01/21/19 10:20	
1,1,2,2-Tetrachloroethane	ug/kg	ND	5.0	1.0	01/21/19 10:20	
1,1,2-Trichloroethane	ug/kg	ND	5.0	0.63	01/21/19 10:20	
1,1-Dichloroethane	ug/kg	ND	5.0	0.39	01/21/19 10:20	
1,1-Dichloroethene	ug/kg	ND	5.0	0.64	01/21/19 10:20	
1,1-Dichloropropene	ug/kg	ND	5.0	0.90	01/21/19 10:20	
1,2,3-Trichlorobenzene	ug/kg	1.4J	5.0	0.80	01/21/19 10:20	
1,2,3-Trichloropropane	ug/kg	ND	5.0	2.1	01/21/19 10:20	
1,2,4-Trichlorobenzene	ug/kg	ND	5.0	0.80	01/21/19 10:20	
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	0.67	01/21/19 10:20	
1,2-Dibromo-3-chloropropane	ug/kg	ND	10.0	1.8	01/21/19 10:20	
1,2-Dibromoethane (EDB)	ug/kg	ND	5.0	0.54	01/21/19 10:20	
1,2-Dichlorobenzene	ug/kg	ND	5.0	0.62	01/21/19 10:20	
1,2-Dichloroethane	ug/kg	ND	5.0	0.40	01/21/19 10:20	
1,2-Dichloroethene (Total)	ug/kg	ND	5.0	1.1	01/21/19 10:20	
1,2-Dichloropropane	ug/kg	ND	5.0	0.98	01/21/19 10:20	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	0.63	01/21/19 10:20	
1,3-Dichlorobenzene	ug/kg	ND	5.0	0.72	01/21/19 10:20	
1,3-Dichloropropane	ug/kg	ND	5.0	0.69	01/21/19 10:20	
1,4-Dichlorobenzene	ug/kg	ND	5.0	0.81	01/21/19 10:20	
2,2-Dichloropropane	ug/kg	ND	5.0	0.48	01/21/19 10:20	
2-Butanone (MEK)	ug/kg	ND	10.0	3.4	01/21/19 10:20	
2-Chlorotoluene	ug/kg	ND	5.0	0.73	01/21/19 10:20	
2-Hexanone	ug/kg	ND	20.0	2.5	01/21/19 10:20	
4-Chlorotoluene	ug/kg	ND	5.0	0.60	01/21/19 10:20	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	10.0	3.0	01/21/19 10:20	
Acetone	ug/kg	ND	20.0	16.2	01/21/19 10:20	
Benzene	ug/kg	ND	5.0	0.49	01/21/19 10:20	
Bromobenzene	ug/kg	ND	5.0	0.94	01/21/19 10:20	
Bromochloromethane	ug/kg	ND	5.0	0.60	01/21/19 10:20	
Bromodichloromethane	ug/kg	ND	5.0	0.60	01/21/19 10:20	
Bromoform	ug/kg	ND	5.0	0.58	01/21/19 10:20	
Bromomethane	ug/kg	ND	5.0	2.9	01/21/19 10:20	
Carbon disulfide	ug/kg	ND	5.0	0.64	01/21/19 10:20	
Carbon tetrachloride	ug/kg	ND	5.0	0.86	01/21/19 10:20	
Chlorobenzene	ug/kg	ND	5.0	0.63	01/21/19 10:20	
Chloroethane	ug/kg	ND	5.0	1.5	01/21/19 10:20	
Chloroform	ug/kg	ND	5.0	0.49	01/21/19 10:20	
Chloromethane	ug/kg	ND	5.0	0.80	01/21/19 10:20	
cis-1,2-Dichloroethene	ug/kg	ND	5.0	0.43	01/21/19 10:20	

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

METHOD BLANK: 2320287 Matrix: Solid
Associated Lab Samples: 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/kg	ND	5.0	0.53	01/21/19 10:20	
Dibromochloromethane	ug/kg	ND	5.0	0.65	01/21/19 10:20	
Dibromomethane	ug/kg	ND	5.0	0.60	01/21/19 10:20	
Dichlorodifluoromethane	ug/kg	ND	5.0	1.2	01/21/19 10:20	
Ethylbenzene	ug/kg	ND	5.0	0.46	01/21/19 10:20	
Hexachloro-1,3-butadiene	ug/kg	ND	5.0	0.85	01/21/19 10:20	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	0.57	01/21/19 10:20	
Methyl-tert-butyl ether	ug/kg	ND	5.0	0.48	01/21/19 10:20	
Methylene chloride	ug/kg	ND	5.0	2.7	01/21/19 10:20	
n-Butylbenzene	ug/kg	ND	5.0	0.65	01/21/19 10:20	
n-Hexane	ug/kg	ND	5.0	2.5	01/21/19 10:20	
n-Propylbenzene	ug/kg	ND	5.0	0.80	01/21/19 10:20	
Naphthalene	ug/kg	1.8J	10.0	0.82	01/21/19 10:20	
p-Isopropyltoluene	ug/kg	ND	5.0	0.69	01/21/19 10:20	
sec-Butylbenzene	ug/kg	ND	5.0	0.73	01/21/19 10:20	
Styrene	ug/kg	ND	5.0	0.59	01/21/19 10:20	
tert-Butylbenzene	ug/kg	ND	5.0	0.88	01/21/19 10:20	
Tetrachloroethene	ug/kg	ND	5.0	0.41	01/21/19 10:20	
Toluene	ug/kg	ND	5.0	0.35	01/21/19 10:20	
trans-1,2-Dichloroethene	ug/kg	ND	5.0	0.68	01/21/19 10:20	
trans-1,3-Dichloropropene	ug/kg	ND	5.0	0.46	01/21/19 10:20	
Trichloroethene	ug/kg	ND	5.0	0.72	01/21/19 10:20	
Trichlorofluoromethane	ug/kg	ND	5.0	0.61	01/21/19 10:20	
Vinyl chloride	ug/kg	ND	5.0	0.67	01/21/19 10:20	
Xylene (Total)	ug/kg	ND	5.0	1.1	01/21/19 10:20	
1,2-Dichloroethane-d4 (S)	%	101	80-123		01/21/19 10:20	
4-Bromofluorobenzene (S)	%	96	69-133		01/21/19 10:20	
Toluene-d8 (S)	%	102	78-122		01/21/19 10:20	

LABORATORY CONTROL SAMPLE: 2320288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	100	99.2	99	79-131	
1,1,1-Trichloroethane	ug/kg	100	106	106	75-138	
1,1,2,2-Tetrachloroethane	ug/kg	100	97.4	97	71-127	
1,1,2-Trichloroethane	ug/kg	100	94.8	95	77-118	
1,1-Dichloroethane	ug/kg	100	99.6	100	79-127	
1,1-Dichloroethene	ug/kg	100	96.6	97	66-135	
1,1-Dichloropropene	ug/kg	100	103	103	69-143	
1,2,3-Trichlorobenzene	ug/kg	100	101	101	78-122	
1,2,3-Trichloropropane	ug/kg	100	98.6	99	74-119	
1,2,4-Trichlorobenzene	ug/kg	100	101	101	71-129	
1,2,4-Trimethylbenzene	ug/kg	100	96.2	96	73-130	
1,2-Dibromo-3-chloropropane	ug/kg	100	105	105	72-139	

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2320288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/kg	100	100	100	81-121	
1,2-Dichlorobenzene	ug/kg	100	99.7	100	74-123	
1,2-Dichloroethane	ug/kg	100	94.8	95	77-117	
1,2-Dichloroethene (Total)	ug/kg	200	191	96	77-127	
1,2-Dichloropropane	ug/kg	100	98.2	98	70-126	
1,3,5-Trimethylbenzene	ug/kg	100	96.3	96	74-131	
1,3-Dichlorobenzene	ug/kg	100	98.1	98	75-124	
1,3-Dichloropropane	ug/kg	100	92.1	92	80-121	
1,4-Dichlorobenzene	ug/kg	100	97.8	98	74-125	
2,2-Dichloropropane	ug/kg	100	104	104	70-146	
2-Butanone (MEK)	ug/kg	500	497	99	66-121	
2-Chlorotoluene	ug/kg	100	95.9	96	75-127	
2-Hexanone	ug/kg	500	492	98	67-124	
4-Chlorotoluene	ug/kg	100	95.7	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/kg	500	507	101	70-120	
Acetone	ug/kg	500	486	97	60-134	
Benzene	ug/kg	100	100	100	77-122	
Bromobenzene	ug/kg	100	94.6	95	79-121	
Bromochloromethane	ug/kg	100	94.3	94	74-123	
Bromodichloromethane	ug/kg	100	102	102	80-133	
Bromoform	ug/kg	100	105	105	76-150	
Bromomethane	ug/kg	100	73.9	74	24-174	
Carbon disulfide	ug/kg	100	91.2	91	59-145	
Carbon tetrachloride	ug/kg	100	106	106	73-150	
Chlorobenzene	ug/kg	100	98.3	98	76-123	
Chloroethane	ug/kg	100	97.0	97	34-164	
Chloroform	ug/kg	100	103	103	80-122	
Chloromethane	ug/kg	100	106	106	10-170	
cis-1,2-Dichloroethene	ug/kg	100	101	101	81-121	
cis-1,3-Dichloropropene	ug/kg	100	104	104	71-137	
Dibromochloromethane	ug/kg	100	104	104	78-137	
Dibromomethane	ug/kg	100	100	100	82-119	
Dichlorodifluoromethane	ug/kg	100	93.7	94	10-186	
Ethylbenzene	ug/kg	100	98.0	98	74-126	
Hexachloro-1,3-butadiene	ug/kg	100	101	101	68-146	
Isopropylbenzene (Cumene)	ug/kg	100	98.6	99	75-133	
Methyl-tert-butyl ether	ug/kg	100	94.6	95	74-120	
Methylene chloride	ug/kg	100	98.5	99	64-138	
n-Butylbenzene	ug/kg	100	105	105	70-140	
n-Hexane	ug/kg	100	110	110	55-142	
n-Propylbenzene	ug/kg	100	101	101	72-134	
Naphthalene	ug/kg	100	101	101	73-117	
p-Isopropyltoluene	ug/kg	100	99.8	100	72-135	
sec-Butylbenzene	ug/kg	100	107	107	72-132	
Styrene	ug/kg	100	100	100	77-127	
tert-Butylbenzene	ug/kg	100	99.7	100	74-133	
Tetrachloroethene	ug/kg	100	103	103	75-135	

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2320288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	100	108	108	73-122	
trans-1,2-Dichloroethene	ug/kg	100	90.6	91	71-134	
trans-1,3-Dichloropropene	ug/kg	100	102	102	72-142	
Trichloroethene	ug/kg	100	109	109	73-127	
Trichlorofluoromethane	ug/kg	100	85.6	86	55-155	
Vinyl chloride	ug/kg	100	124	124	36-162	
Xylene (Total)	ug/kg	300	313	104	75-123	
1,2-Dichloroethane-d4 (S)	%			100	80-123	
4-Bromofluorobenzene (S)	%			97	69-133	
Toluene-d8 (S)	%			99	78-122	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2320604 2320605

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max		
		60292258001	Result	Spike Conc.	MSD Spike Conc.				RPD	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/kg	ND	129	127	96.5	86.8	75	68	33-130	11	34
1,1,1-Trichloroethane	ug/kg	ND	129	127	106	102	83	80	45-129	5	45
1,1,2,2-Tetrachloroethane	ug/kg	ND	129	127	92.5	87.8	72	69	5-157	5	41
1,1,2-Trichloroethane	ug/kg	ND	129	127	95.3	88.4	74	69	28-133	7	32
1,1-Dichloroethane	ug/kg	ND	129	127	101	95.6	78	75	43-126	6	32
1,1-Dichloroethene	ug/kg	ND	129	127	106	103	82	81	33-132	2	38
1,1-Dichloropropene	ug/kg	ND	129	127	105	99.6	82	78	36-132	5	36
1,2,3-Trichlorobenzene	ug/kg	ND	129	127	71.5	60.6	55	48	10-135	17	45
1,2,3-Trichloropropane	ug/kg	ND	129	127	92.1	88.8	71	70	15-153	4	35
1,2,4-Trichlorobenzene	ug/kg	ND	129	127	70.0	58.6	54	46	10-135	18	43
1,2,4-Trimethylbenzene	ug/kg	ND	129	127	84.8	75.1	66	59	15-129	12	41
1,2-Dibromo-3-chloropropane	ug/kg	ND	129	127	95.2	88.7	74	70	10-155	7	38
1,2-Dibromoethane (EDB)	ug/kg	ND	129	127	100	91.7	78	72	38-128	9	32
1,2-Dichlorobenzene	ug/kg	ND	129	127	85.0	75.0	66	59	12-132	12	38
1,2-Dichloroethane	ug/kg	ND	129	127	97.6	92.1	76	72	45-117	6	29
1,2-Dichloroethene (Total)	ug/kg	ND	258	255	203	193	79	76	37-127	5	33
1,2-Dichloropropane	ug/kg	ND	129	127	98.7	92.7	77	73	46-116	6	31
1,3,5-Trimethylbenzene	ug/kg	ND	129	127	85.2	75.9	66	60	19-130	12	38
1,3-Dichlorobenzene	ug/kg	ND	129	127	83.3	73.3	65	58	14-130	13	39
1,3-Dichloropropane	ug/kg	ND	129	127	92.9	84.6	72	66	38-124	9	31
1,4-Dichlorobenzene	ug/kg	ND	129	127	81.9	72.5	64	57	12-130	12	39
2,2-Dichloropropane	ug/kg	ND	129	127	107	101	83	80	37-135	6	33
2-Butanone (MEK)	ug/kg	ND	644	637	514	477	80	75	32-130	8	33
2-Chlorotoluene	ug/kg	ND	129	127	86.0	77.3	67	61	18-133	11	38
2-Hexanone	ug/kg	ND	644	637	511	466	79	73	31-131	9	32
4-Chlorotoluene	ug/kg	ND	129	127	84.3	74.0	65	58	24-128	13	39
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	644	637	527	491	82	77	38-129	7	30
Acetone	ug/kg	24.9J	644	637	541	499	80	74	25-143	8	39
Benzene	ug/kg	ND	129	127	98.7	93.4	77	73	51-124	5	28

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

Parameter	Units	60292258001		MS		MSD		MS		MSD		% Rec	Limits	Max	
		Result	Conc.	Spike	Conc.	Spike	Result	MSD	Result	% Rec	MSD			RPD	RPD
Bromobenzene	ug/kg	ND	129	127	87.8	80.1	68	63	21-130	9	39				
Bromoform	ug/kg	ND	129	127	97.6	91.2	76	72	40-124	7	29				
Bromochloromethane	ug/kg	ND	129	127	102	96.4	79	76	37-130	6	30				
Bromodichloromethane	ug/kg	ND	129	127	99.9	90.4	78	71	25-142	10	37				
Bromomethane	ug/kg	ND	129	127	90.4	86.5	70	68	10-158	4	47				
Carbon disulfide	ug/kg	ND	129	127	96.7	91.8	75	72	26-133	5	41				
Carbon tetrachloride	ug/kg	ND	129	127	105	99.7	82	78	40-136	5	35				
Chlorobenzene	ug/kg	ND	129	127	93.8	84.4	73	66	25-133	11	36				
Chloroethane	ug/kg	ND	129	127	103	99.0	80	78	10-160	4	42				
Chloroform	ug/kg	ND	129	127	104	98.5	81	77	47-119	5	31				
Chloromethane	ug/kg	ND	129	127	103	101	80	79	10-143	2	38				
cis-1,2-Dichloroethene	ug/kg	ND	129	127	100	94.4	78	74	45-125	6	32				
cis-1,3-Dichloropropene	ug/kg	ND	129	127	102	94.7	79	74	43-125	7	36				
Dibromochloromethane	ug/kg	ND	129	127	101	91.9	78	72	46-129	9	34				
Dibromomethane	ug/kg	ND	129	127	102	96.3	79	76	38-124	6	30				
Dichlorodifluoromethane	ug/kg	ND	129	127	90.0	88.6	70	70	10-156	1	40				
Ethylbenzene	ug/kg	ND	129	127	93.8	85.5	73	67	38-131	9	32				
Hexachloro-1,3-butadiene	ug/kg	ND	129	127	64.2	55.0	50	43	10-134	15	44				
Isopropylbenzene (Cumene)	ug/kg	ND	129	127	91.0	82.2	71	65	26-129	10	37				
Methyl-tert-butyl ether	ug/kg	ND	129	127	107	102	83	80	49-120	5	41				
Methylene chloride	ug/kg	ND	129	127	103	101	78	77	37-123	2	36				
n-Butylbenzene	ug/kg	ND	129	127	82.2	70.8	64	56	10-132	15	39				
n-Hexane	ug/kg	ND	129	127	89.8	83.9	70	66	37-149	7	15				
n-Propylbenzene	ug/kg	ND	129	127	88.1	77.0	68	60	26-130	13	38				
Naphthalene	ug/kg	70.3	129	127	159	176	69	83	10-144	10	41				
p-Isopropyltoluene	ug/kg	ND	129	127	83.1	73.7	64	58	14-130	12	39				
sec-Butylbenzene	ug/kg	ND	129	127	88.5	79.0	69	62	15-131	11	38				
Styrene	ug/kg	ND	129	127	92.8	84.4	72	66	29-128	9	38				
tert-Butylbenzene	ug/kg	ND	129	127	86.1	77.5	67	61	26-133	11	39				
Tetrachloroethene	ug/kg	ND	129	127	97.1	87.0	75	68	31-132	11	38				
Toluene	ug/kg	ND	129	127	107	96.5	83	76	40-129	10	30				
trans-1,2-Dichloroethene	ug/kg	ND	129	127	102	98.4	79	77	40-126	4	36				
trans-1,3-Dichloropropene	ug/kg	ND	129	127	102	93.2	79	73	30-131	9	39				
Trichloroethene	ug/kg	ND	129	127	108	103	84	81	34-129	5	35				
Trichlorofluoromethane	ug/kg	ND	129	127	95.2	91.4	74	72	30-139	4	40				
Vinyl chloride	ug/kg	ND	129	127	128	127	99	100	17-139	1	42				
Xylene (Total)	ug/kg	ND	387	382	300	271	78	71	32-133	10	43				
1,2-Dichloroethane-d4 (S)	%						104	105	80-123						
4-Bromofluorobenzene (S)	%						98	97	69-133						
Toluene-d8 (S)	%						99	98	78-122						

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

QC Batch: 565704 Analysis Method: EPA 8260

QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics

Associated Lab Samples: 60291978004, 60291978006

METHOD BLANK: 2320978 Matrix: Solid

Associated Lab Samples: 60291978004, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Toluene	ug/kg	ND	5.0	0.35	01/22/19 11:12	
1,2-Dichloroethane-d4 (S)	%	99	80-123		01/22/19 11:12	
4-Bromofluorobenzene (S)	%	100	69-133		01/22/19 11:12	
Toluene-d8 (S)	%	101	78-122		01/22/19 11:12	

LABORATORY CONTROL SAMPLE: 2320979

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/kg	100	106	106	73-122	
1,2-Dichloroethane-d4 (S)	%			95	80-123	
4-Bromofluorobenzene (S)	%			98	69-133	
Toluene-d8 (S)	%			100	78-122	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2320980 2320981

Parameter	Units	60291757001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Qual
Toluene	ug/kg	ND	130	133	100	103	77	78	40-129	3	30	
1,2-Dichloroethane-d4 (S)	%						102	99	80-123			
4-Bromofluorobenzene (S)	%						100	101	69-133			
Toluene-d8 (S)	%						99	98	78-122			

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

QC Batch: 564877 Analysis Method: EPA 8270

QC Batch Method: EPA 3546 Analysis Description: 8270 Solid MSSV Microwave

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

METHOD BLANK: 2317698 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	329	29.9	01/17/19 20:34	
1,2-Dichlorobenzene	ug/kg	ND	329	24.9	01/17/19 20:34	
1,3-Dichlorobenzene	ug/kg	ND	329	27.9	01/17/19 20:34	
1,4-Dichlorobenzene	ug/kg	ND	329	28.9	01/17/19 20:34	
2,4,5-Trichlorophenol	ug/kg	ND	329	29.9	01/17/19 20:34	
2,4,6-Trichlorophenol	ug/kg	ND	329	30.9	01/17/19 20:34	
2,4-Dichlorophenol	ug/kg	ND	329	29.9	01/17/19 20:34	
2,4-Dimethylphenol	ug/kg	ND	329	17.9	01/17/19 20:34	
2,4-Dinitrophenol	ug/kg	ND	1660	47.8	01/17/19 20:34	
2,4-Dinitrotoluene	ug/kg	ND	329	27.9	01/17/19 20:34	
2,6-Dinitrotoluene	ug/kg	ND	329	33.9	01/17/19 20:34	
2-Chloronaphthalene	ug/kg	ND	329	27.9	01/17/19 20:34	
2-Chlorophenol	ug/kg	ND	329	26.9	01/17/19 20:34	
2-Methylnaphthalene	ug/kg	ND	329	23.9	01/17/19 20:34	
2-Methylphenol(o-Cresol)	ug/kg	ND	329	30.9	01/17/19 20:34	
2-Nitroaniline	ug/kg	ND	658	55.8	01/17/19 20:34	
2-Nitrophenol	ug/kg	ND	329	45.8	01/17/19 20:34	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	329	35.9	01/17/19 20:34	
3,3'-Dichlorobenzidine	ug/kg	ND	658	113	01/17/19 20:34	
3-Nitroaniline	ug/kg	ND	658	99.6	01/17/19 20:34	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1660	43.8	01/17/19 20:34	
4-Bromophenylphenyl ether	ug/kg	ND	329	25.9	01/17/19 20:34	
4-Chloro-3-methylphenol	ug/kg	ND	658	35.9	01/17/19 20:34	
4-Chloroaniline	ug/kg	ND	658	64.8	01/17/19 20:34	
4-Chlorophenylphenyl ether	ug/kg	ND	329	31.9	01/17/19 20:34	
4-Nitroaniline	ug/kg	ND	658	84.7	01/17/19 20:34	
4-Nitrophenol	ug/kg	ND	1660	51.8	01/17/19 20:34	
Acenaphthene	ug/kg	ND	329	34.9	01/17/19 20:34	
Acenaphthylene	ug/kg	ND	329	30.9	01/17/19 20:34	
Anthracene	ug/kg	ND	329	34.9	01/17/19 20:34	
Benzo(a)anthracene	ug/kg	ND	329	29.9	01/17/19 20:34	
Benzo(a)pyrene	ug/kg	ND	329	25.9	01/17/19 20:34	
Benzo(b)fluoranthene	ug/kg	ND	329	22.9	01/17/19 20:34	
Benzo(g,h,i)perylene	ug/kg	ND	329	31.9	01/17/19 20:34	
Benzo(k)fluoranthene	ug/kg	ND	329	38.9	01/17/19 20:34	
Benzoic acid	ug/kg	ND	1660	30.9	01/17/19 20:34	
Benzyl alcohol	ug/kg	ND	658	103	01/17/19 20:34	
bis(2-Chloroethoxy)methane	ug/kg	ND	329	25.9	01/17/19 20:34	
bis(2-Chloroethyl) ether	ug/kg	ND	329	25.9	01/17/19 20:34	
bis(2-Chloroisopropyl) ether	ug/kg	ND	329	25.9	01/17/19 20:34	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	329	114	01/17/19 20:34	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

METHOD BLANK: 2317698 Matrix: Solid
Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	329	42.8	01/17/19 20:34	
Carbazole	ug/kg	ND	329	26.9	01/17/19 20:34	N2
Chrysene	ug/kg	ND	329	27.9	01/17/19 20:34	
Di-n-butylphthalate	ug/kg	ND	329	34.9	01/17/19 20:34	
Di-n-octylphthalate	ug/kg	ND	329	38.9	01/17/19 20:34	
Dibenz(a,h)anthracene	ug/kg	ND	329	29.9	01/17/19 20:34	
Dibenzofuran	ug/kg	ND	329	29.9	01/17/19 20:34	
Diethylphthalate	ug/kg	ND	329	30.9	01/17/19 20:34	
Dimethylphthalate	ug/kg	ND	329	31.9	01/17/19 20:34	
Fluoranthene	ug/kg	ND	329	30.9	01/17/19 20:34	
Fluorene	ug/kg	ND	329	30.9	01/17/19 20:34	
Hexachloro-1,3-butadiene	ug/kg	ND	329	32.9	01/17/19 20:34	
Hexachlorobenzene	ug/kg	ND	329	31.9	01/17/19 20:34	
Hexachlorocyclopentadiene	ug/kg	ND	329	69.7	01/17/19 20:34	
Hexachloroethane	ug/kg	ND	329	24.9	01/17/19 20:34	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	329	35.9	01/17/19 20:34	
Isophorone	ug/kg	ND	329	29.9	01/17/19 20:34	
N-Nitroso-di-n-propylamine	ug/kg	ND	329	32.9	01/17/19 20:34	
N-Nitrosodiphenylamine	ug/kg	ND	329	25.9	01/17/19 20:34	
Naphthalene	ug/kg	ND	329	25.9	01/17/19 20:34	
Nitrobenzene	ug/kg	ND	329	30.9	01/17/19 20:34	
Pentachlorophenol	ug/kg	ND	1660	30.9	01/17/19 20:34	
Phenanthrene	ug/kg	ND	329	30.9	01/17/19 20:34	
Phenol	ug/kg	ND	329	25.9	01/17/19 20:34	
Pyrene	ug/kg	ND	329	32.9	01/17/19 20:34	
Pyridine	ug/kg	ND	329	26.9	01/17/19 20:34	
2,4,6-Tribromophenol (S)	%	62	35-119		01/17/19 20:34	
2-Fluorobiphenyl (S)	%	71	55-110		01/17/19 20:34	
2-Fluorophenol (S)	%	82	46-108		01/17/19 20:34	
Nitrobenzene-d5 (S)	%	74	35-119		01/17/19 20:34	
Phenol-d6 (S)	%	78	48-110		01/17/19 20:34	
Terphenyl-d14 (S)	%	85	45-114		01/17/19 20:34	

LABORATORY CONTROL SAMPLE: 2317699

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1650	1080	66	56-97	
1,2-Dichlorobenzene	ug/kg	1650	1120	68	56-91	
1,3-Dichlorobenzene	ug/kg	1650	1150	70	54-90	
1,4-Dichlorobenzene	ug/kg	1650	1140	69	54-92	
2,4,5-Trichlorophenol	ug/kg	1650	1030	63	59-101	
2,4,6-Trichlorophenol	ug/kg	1650	1080	65	58-101	
2,4-Dichlorophenol	ug/kg	1650	1090	66	59-98	
2,4-Dimethylphenol	ug/kg	1650	1120	68	47-98	

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QUALITY CONTROL DATA

Project: Big Ox Energy

Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2317699

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dinitrophenol	ug/kg	1650	244J	15	10-139	
2,4-Dinitrotoluene	ug/kg	1650	1140	70	61-105	
2,6-Dinitrotoluene	ug/kg	1650	1120	68	62-100	
2-Chloronaphthalene	ug/kg	1650	1130	69	59-95	
2-Chlorophenol	ug/kg	1650	1200	73	57-95	
2-Methylnaphthalene	ug/kg	1650	1150	70	60-93	
2-Methylphenol(o-Cresol)	ug/kg	1650	1090	66	57-94	
2-Nitroaniline	ug/kg	1650	1270	77	57-106	
2-Nitrophenol	ug/kg	1650	1090	66	50-108	
3&4-Methylphenol(m&p Cresol)	ug/kg	1650	1170	71	57-95	
3,3'-Dichlorobenzidine	ug/kg	1650	1010	61	11-126	
3-Nitroaniline	ug/kg	1650	1140	69	38-108	
4,6-Dinitro-2-methylphenol	ug/kg	1650	469J	28	23-130	
4-Bromophenylphenyl ether	ug/kg	1650	1190	72	59-98	
4-Chloro-3-methylphenol	ug/kg	1650	1150	70	60-99	
4-Chloroaniline	ug/kg	1650	637J	39	12-102	
4-Chlorophenylphenyl ether	ug/kg	1650	1070	65	59-98	
4-Nitroaniline	ug/kg	1650	1200	73	53-100	
4-Nitrophenol	ug/kg	1650	1260J	77	58-108	
Acenaphthene	ug/kg	1650	1150	70	60-95	
Acenaphthylene	ug/kg	1650	1130	69	60-95	
Anthracene	ug/kg	1650	1260	76	61-97	
Benzo(a)anthracene	ug/kg	1650	1260	77	62-98	
Benzo(a)pyrene	ug/kg	1650	1280	78	60-99	
Benzo(b)fluoranthene	ug/kg	1650	1310	79	61-100	
Benzo(g,h,i)perylene	ug/kg	1650	1200	73	58-98	
Benzo(k)fluoranthene	ug/kg	1650	1310	80	58-100	
Benzoic acid	ug/kg	1650	487J	30	10-110	
Benzyl alcohol	ug/kg	1650	1410	86	52-100	
bis(2-Chloroethoxy)methane	ug/kg	1650	1150	70	57-95	
bis(2-Chloroethyl) ether	ug/kg	1650	1240	76	52-99	
bis(2-Chloroisopropyl) ether	ug/kg	1650	1180	71	49-100	
bis(2-Ethylhexyl)phthalate	ug/kg	1650	1470	89	63-100	
Butylbenzylphthalate	ug/kg	1650	1480	90	59-100	
Carbazole	ug/kg	1650	1280	78	61-96 N2	
Chrysene	ug/kg	1650	1320	80	61-98	
Di-n-butylphthalate	ug/kg	1650	1380	84	58-100	
Di-n-octylphthalate	ug/kg	1650	1530	93	59-110	
Dibenz(a,h)anthracene	ug/kg	1650	1220	74	60-99	
Dibenzofuran	ug/kg	1650	1100	67	59-97	
Diethylphthalate	ug/kg	1650	1210	74	61-97	
Dimethylphthalate	ug/kg	1650	1150	70	61-95	
Fluoranthene	ug/kg	1650	1230	75	61-100	
Fluorene	ug/kg	1650	1120	68	60-98	
Hexachloro-1,3-butadiene	ug/kg	1650	1040	63	56-97	
Hexachlorobenzene	ug/kg	1650	1140	69	57-98	
Hexachlorocyclopentadiene	ug/kg	3290	796	24	24-63	

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

LABORATORY CONTROL SAMPLE: 2317699

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Hexachloroethane	ug/kg	1650	1220	74	54-94	
Indeno(1,2,3-cd)pyrene	ug/kg	1650	1210	74	60-99	
Isophorone	ug/kg	1650	1150	70	55-96	
N-Nitroso-di-n-propylamine	ug/kg	1650	1190	72	54-94	
N-Nitrosodiphenylamine	ug/kg	1650	1110	68	60-98	
Naphthalene	ug/kg	1650	1130	68	58-94	
Nitrobenzene	ug/kg	1650	1170	71	57-98	
Pentachlorophenol	ug/kg	1650	900J	55	39-110	
Phenanthrene	ug/kg	1650	1240	76	60-97	
Phenol	ug/kg	1650	1270	77	56-95	
Pyrene	ug/kg	1650	1330	81	61-100	
Pyridine	ug/kg	1650	886	54	28-86	
2,4,6-Tribromophenol (S)	%			71	35-119	
2-Fluorobiphenyl (S)	%			74	55-110	
2-Fluorophenol (S)	%			86	46-108	
Nitrobenzene-d5 (S)	%			76	35-119	
Phenol-d6 (S)	%			81	48-110	
Terphenyl-d14 (S)	%			88	45-114	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317700 2317701

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max	
		Result	Spike Conc.	Spike Conc.	MS Result				RPD RPD	Qual
1,2,4-Trichlorobenzene	ug/kg	ND	7960	7910	5300J	5310J	67	67	45-102	26
1,2-Dichlorobenzene	ug/kg	ND	7960	7910	5630J	5390J	71	68	42-97	29
1,3-Dichlorobenzene	ug/kg	ND	7960	7910	5690J	5430J	72	69	42-95	28
1,4-Dichlorobenzene	ug/kg	ND	7960	7910	5690J	5430J	72	69	43-95	26
2,4,5-Trichlorophenol	ug/kg	ND	7960	7910	5130J	5020J	65	64	38-112	33
2,4,6-Trichlorophenol	ug/kg	ND	7960	7910	6640J	7040J	84	89	35-112	33
2,4-Dichlorophenol	ug/kg	ND	7960	7910	5070J	4960J	64	63	40-106	29
2,4-Dimethylphenol	ug/kg	ND	7960	7910	5550J	5670J	70	72	16-118	38
2,4-Dinitrophenol	ug/kg	ND	7960	7910	ND	ND	0	0	10-145	30 M1
2,4-Dinitrotoluene	ug/kg	ND	7960	7910	3320J	2710J	42	34	15-136	40
2,6-Dinitrotoluene	ug/kg	ND	7960	7910	5860J	5370J	74	68	27-116	31
2-Chloronaphthalene	ug/kg	ND	7960	7910	5030J	5100J	63	65	43-104	30
2-Chlorophenol	ug/kg	ND	7960	7910	5810J	5700J	73	72	41-100	30
2-Methylnaphthalene	ug/kg	ND	7960	7910	5540J	5550J	70	70	37-111	36
2-Methylphenol(o-Cresol)	ug/kg	ND	7960	7910	5670J	5450J	71	69	31-107	31
2-Nitroaniline	ug/kg	ND	7960	7910	9980J	9980J	126	126	29-129	33
2-Nitrophenol	ug/kg	ND	7960	7910	2560J	2200J	32	28	10-131	50
3&4-Methylphenol(m&p Cresol)	ug/kg	40600	7960	7910	56600	53500	201	163	32-110	6 31 M1
3,3'-Dichlorobenzidine	ug/kg	ND	7960	7910	ND	ND	0	0	10-130	48 M1
3-Nitroaniline	ug/kg	ND	7960	7910	5000J	4820J	63	61	23-111	31
4,6-Dinitro-2-methylphenol	ug/kg	ND	7960	7910	ND	ND	0	0	10-152	16 M1

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

Parameter	Units	60291978001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike	Conc.	Spike	Result	MSD	Result	% Rec	MSD					
4-Bromophenylphenyl ether	ug/kg	ND	7960	7910	5790J	6090J	73	77	39-109	29						
4-Chloro-3-methylphenol	ug/kg	ND	7960	7910	12800J	13900J	161	176	33-118	34	M1					
4-Chloroaniline	ug/kg	ND	7960	7910	3300J	3480J	42	44	10-93	32						
4-Chlorophenylphenyl ether	ug/kg	ND	7960	7910	5190J	5180J	65	66	41-106	29						
4-Nitroaniline	ug/kg	ND	7960	7910	6180J	5630J	78	71	15-120	34						
4-Nitrophenol	ug/kg	ND	7960	7910	11000J	ND	138	0	31-121	30	M1					
Acenaphthene	ug/kg	ND	7960	7910	5280J	5310J	66	67	42-104	36						
Acenaphthylene	ug/kg	ND	7960	7910	5220J	5240J	66	66	39-105	27						
Anthracene	ug/kg	ND	7960	7910	5860J	5980J	74	76	37-111	52						
Benz(a)anthracene	ug/kg	ND	7960	7910	5650J	5900J	71	75	32-113	73						
Benz(a)pyrene	ug/kg	ND	7960	7910	5580J	5640J	70	71	29-112	60						
Benz(b)fluoranthene	ug/kg	ND	7960	7910	5430J	5730J	68	73	19-121	69						
Benz(g,h,i)perylene	ug/kg	ND	7960	7910	5300J	5460J	67	69	20-117	54						
Benz(k)fluoranthene	ug/kg	ND	7960	7910	6080J	5980J	77	76	33-115	56						
Benzoic acid	ug/kg	ND	7960	7910	2290J	2490J	29	32	10-153	30						
Benzyl alcohol	ug/kg	ND	7960	7910	7100J	6920J	89	88	34-111	30						
bis(2-Chloroethoxy)methane	ug/kg	ND	7960	7910	5520J	5360J	70	68	39-105	32						
bis(2-Chloroethyl) ether	ug/kg	ND	7960	7910	6860J	6630J	86	84	43-104	32						
bis(2-Chloroisopropyl) ether	ug/kg	ND	7960	7910	5930J	5780J	75	73	38-104	31						
bis(2-Ethylhexyl)phthalate	ug/kg	ND	7960	7910	9410	10200	95	106	40-123	8	42					
Butylbenzylphthalate	ug/kg	ND	7960	7910	8060	8740	102	111	41-122	8	36					
Carbazole	ug/kg	ND	7960	7910	5940J	5990J	75	76	33-111	39	N2					
Chrysene	ug/kg	ND	7960	7910	5810J	5910J	73	75	31-113	72						
Di-n-butylphthalate	ug/kg	ND	7960	7910	6710J	7090J	84	90	37-116	36						
Di-n-octylphthalate	ug/kg	ND	7960	7910	7390J	7770J	93	98	40-126	35						
Dibenz(a,h)anthracene	ug/kg	ND	7960	7910	5350J	5570J	67	71	29-115	41						
Dibenzofuran	ug/kg	ND	7960	7910	5110J	5090J	64	64	40-110	35						
Diethylphthalate	ug/kg	ND	7960	7910	5720J	5670J	72	72	39-107	43						
Dimethylphthalate	ug/kg	ND	7960	7910	5200J	5700J	65	72	41-103	28						
Fluoranthene	ug/kg	ND	7960	7910	5770J	5830J	73	74	34-113	88						
Fluorene	ug/kg	ND	7960	7910	5120J	5260J	64	67	37-111	40						
Hexachloro-1,3-butadiene	ug/kg	ND	7960	7910	5240J	5230J	66	66	45-102	28						
Hexachlorobenzene	ug/kg	ND	7960	7910	5450J	5670J	69	72	43-101	26						
Hexachlorocyclopentadiene	ug/kg	ND	15900	15800	ND	ND	0	0	10-64	48	M1					
Hexachloroethane	ug/kg	ND	7960	7910	1970J	1320J	25	17	34-104	38	M1					
Indeno(1,2,3-cd)pyrene	ug/kg	ND	7960	7910	5470J	5570J	69	71	27-113	46						
Isophorone	ug/kg	ND	7960	7910	7050J	7240J	89	92	41-101	29						
N-Nitroso-di-n-propylamine	ug/kg	ND	7960	7910	7090J	10100	89	128	39-102	39	M1					
N-Nitrosodiphenylamine	ug/kg	ND	7960	7910	5450J	5370J	69	68	28-120	44						
Naphthalene	ug/kg	ND	7960	7910	5700J	5700J	72	72	39-106	34						
Nitrobenzene	ug/kg	ND	7960	7910	5730J	5250J	72	66	40-104	39						
Pentachlorophenol	ug/kg	ND	7960	7910	3910J	3730J	49	47	10-142	30						
Phenanthrene	ug/kg	ND	7960	7910	5930J	6010J	75	76	31-114	73						
Phenol	ug/kg	21000	7960	7910	28600	37800	96	213	39-101	28	33	M1				
Pyrene	ug/kg	ND	7960	7910	6160J	6500J	78	82	24-129	82						
Pyridine	ug/kg	ND	7960	7910	5550J	6540J	70	83	14-84	37						

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2317700		2317701							
Parameter	Units	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Max Qual
2,4,6-Tribromophenol (S)	%					59	61	35-119	46		
2-Fluorobiphenyl (S)	%					66	69	55-110	44		
2-Fluorophenol (S)	%					81	82	46-108	36		
Nitrobenzene-d5 (S)	%					69	70	35-119	43 P3		
Phenol-d6 (S)	%					79	77	48-110	38		
Terphenyl-d14 (S)	%					85	93	45-114	50		

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QUALITY CONTROL DATA

Project: Big Ox Energy
Pace Project No.: 60291978

QC Batch:	564883	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight/Percent Moisture
Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006			

METHOD BLANK: 2317713 Matrix: Solid

Associated Lab Samples: 60291978001, 60291978002, 60291978003, 60291978004, 60291978005, 60291978006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Percent Moisture	%	ND	0.50	0.50	01/16/19 14:15	

SAMPLE DUPLICATE: 2317714

Parameter	Units	60291829004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.5	19.2	2	20	

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QUALIFIERS

Project: Big Ox Energy
Pace Project No.: 60291978

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- R1 RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Big Ox Energy
Pace Project No.: 60291978

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291978001	DS-1	EPA 3050	564878	EPA 6010	565043
60291978002	DS-2	EPA 3050	564878	EPA 6010	565043
60291978003	DS-3	EPA 3050	564878	EPA 6010	565043
60291978004	DS-4	EPA 3050	564878	EPA 6010	565043
60291978005	DS-5	EPA 3050	564878	EPA 6010	565043
60291978006	DS-6	EPA 3050	564878	EPA 6010	565043
60291978001	DS-1	EPA 7471	564920	EPA 7471	564986
60291978002	DS-2	EPA 7471	564920	EPA 7471	564986
60291978003	DS-3	EPA 7471	564920	EPA 7471	564986
60291978004	DS-4	EPA 7471	564920	EPA 7471	564986
60291978005	DS-5	EPA 7471	564920	EPA 7471	564986
60291978006	DS-6	EPA 7471	564920	EPA 7471	564986
60291978001	DS-1	EPA 3546	564877	EPA 8270	565189
60291978002	DS-2	EPA 3546	564877	EPA 8270	565189
60291978003	DS-3	EPA 3546	564877	EPA 8270	565189
60291978004	DS-4	EPA 3546	564877	EPA 8270	565189
60291978005	DS-5	EPA 3546	564877	EPA 8270	565189
60291978006	DS-6	EPA 3546	564877	EPA 8270	565189
60291978001	DS-1	EPA 8260	565289		
60291978002	DS-2	EPA 8260	565289		
60291978003	DS-3	EPA 8260	565289		
60291978003	DS-3	EPA 8260	565505		
60291978004	DS-4	EPA 8260	565505		
60291978004	DS-4	EPA 8260	565704		
60291978005	DS-5	EPA 8260	565505		
60291978006	DS-6	EPA 8260	565505		
60291978006	DS-6	EPA 8260	565704		
60291978001	DS-1	ASTM D2974	564883		
60291978002	DS-2	ASTM D2974	564883		
60291978003	DS-3	ASTM D2974	564883		
60291978004	DS-4	ASTM D2974	564883		
60291978005	DS-5	ASTM D2974	564883		
60291978006	DS-6	ASTM D2974	564883		

REPORT OF LABORATORY ANALYSIS

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60291978

 Client Name: EA Eng Science

 Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

 Tracking #: 1Z1e35804619155552 Pace Shipping Label Used? Yes No

 Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

 Packing Material: Bubble Wrap Bubble Bags Foam None Other

 Thermometer Used: -30 Type of Ice: Wet Blue None

 Cooler Temperature (°C): As-read 1.9 Corr. Factor 0.0 Corrected 1.9

 Date and initials of person examining contents: 115119 AP

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <u>5 Day</u>	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<u>115119</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>SL</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>8 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Cyanide water sample checks:	List sample IDs, volumes, lot #'s of preservative and the date/time added.	
Lead acetate strip turns dark? (Record only)		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State: <u>NF</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

 Copy COC to Client? Y /

 Field Data Required? Y /

Person Contacted:

Date/Time:

Comments/ Resolution:

Project Manager Review:

JPL

 Date: 1-16-19

Samples collected have foul odor!!

Pace Analytical
www.paceabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:																																																																																			
Company: EA Eng Science and Technology	Report To: Kent Dixon	Copy To: Dan Bigbee	Attention: Accounts Payable, Kent Dixon																																																																																				
Address: 221 Sun Valley Blvd Suite D Lincoln, NE 68528			Company Name: EA Eng Science and Technology																																																																																				
Email To: kdixon@eaest.com	Purchase Order No.: LSO #		Address: 55418 (JR)	<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER																																																																																			
Phone: 402-877-7676	Fax:	Project Name: Big Ox Energy	Reference: Pace Project Manager	<input type="checkbox"/> UST <input type="checkbox"/> RCRA																																																																																			
Requested Due Date/TAT: 5 DAY	Project Number:		Pace Profile #: 12635 Line 1	Site Location: NE	STATE: NE																																																																																		
REGULATORY AGENCY																																																																																							
<input type="checkbox"/> Residual Chlorine (Y/N)																																																																																							
Pace Project No./Lab ID. 60291978																																																																																							
Requested Analysis Filtered (Y/N)																																																																																							
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ADDITIONAL COMMENTS		DATE: 14Jan19	TIME: 1630	ACCEPTED BY / AFFILIATION																																																																																			
Ship To: 9608 Lorret Boulevard, Lenexa, KS 66219		PRINT Name of SAMPLER: <i>Kent Dixon / EA</i>		DATE: 11/19/2019	TIME: 0940																																																																																		
		SIGNATURE of SAMPLER: <i>Kent Dixon</i>		DATE Signed (MM/DD/YY): 01/14/19																																																																																			
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*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007